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Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952

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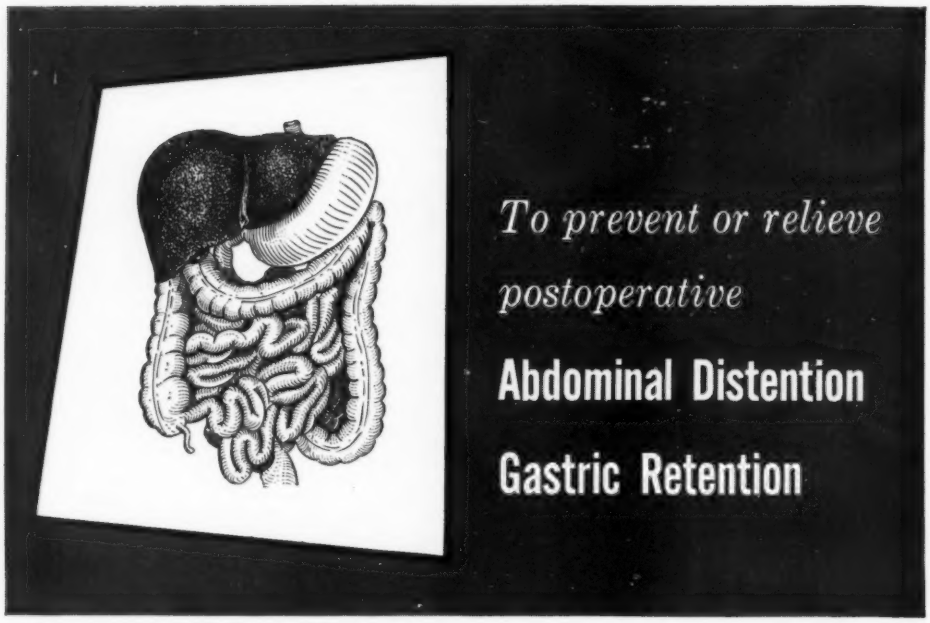

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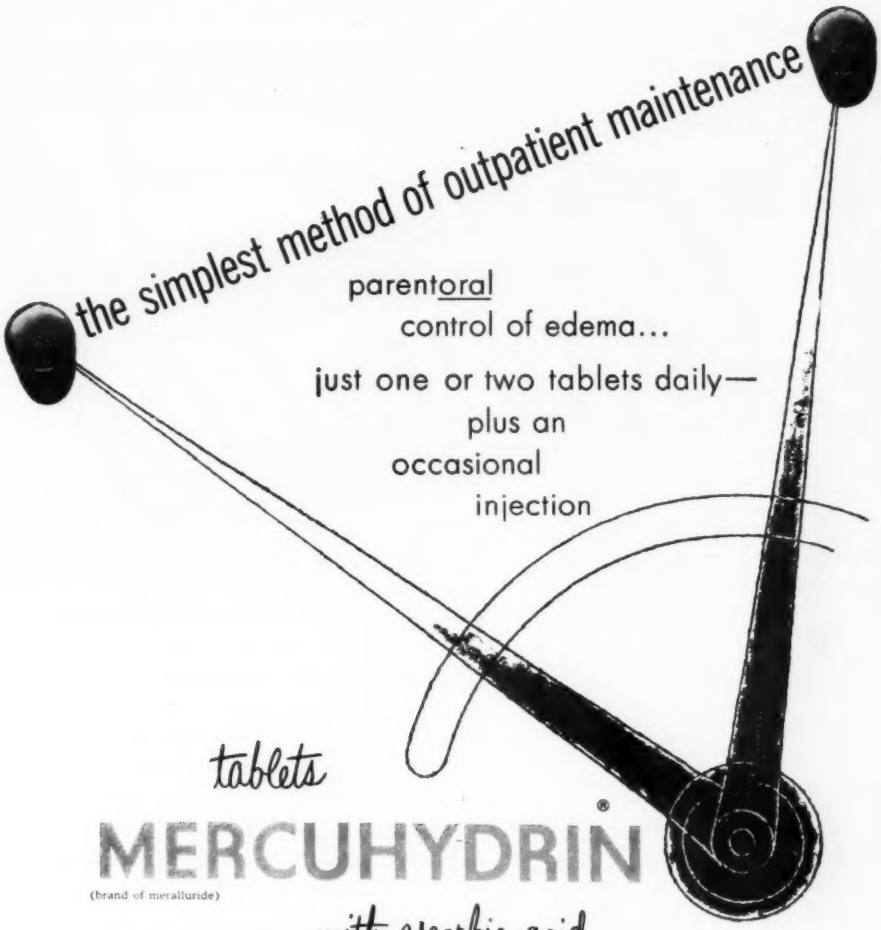

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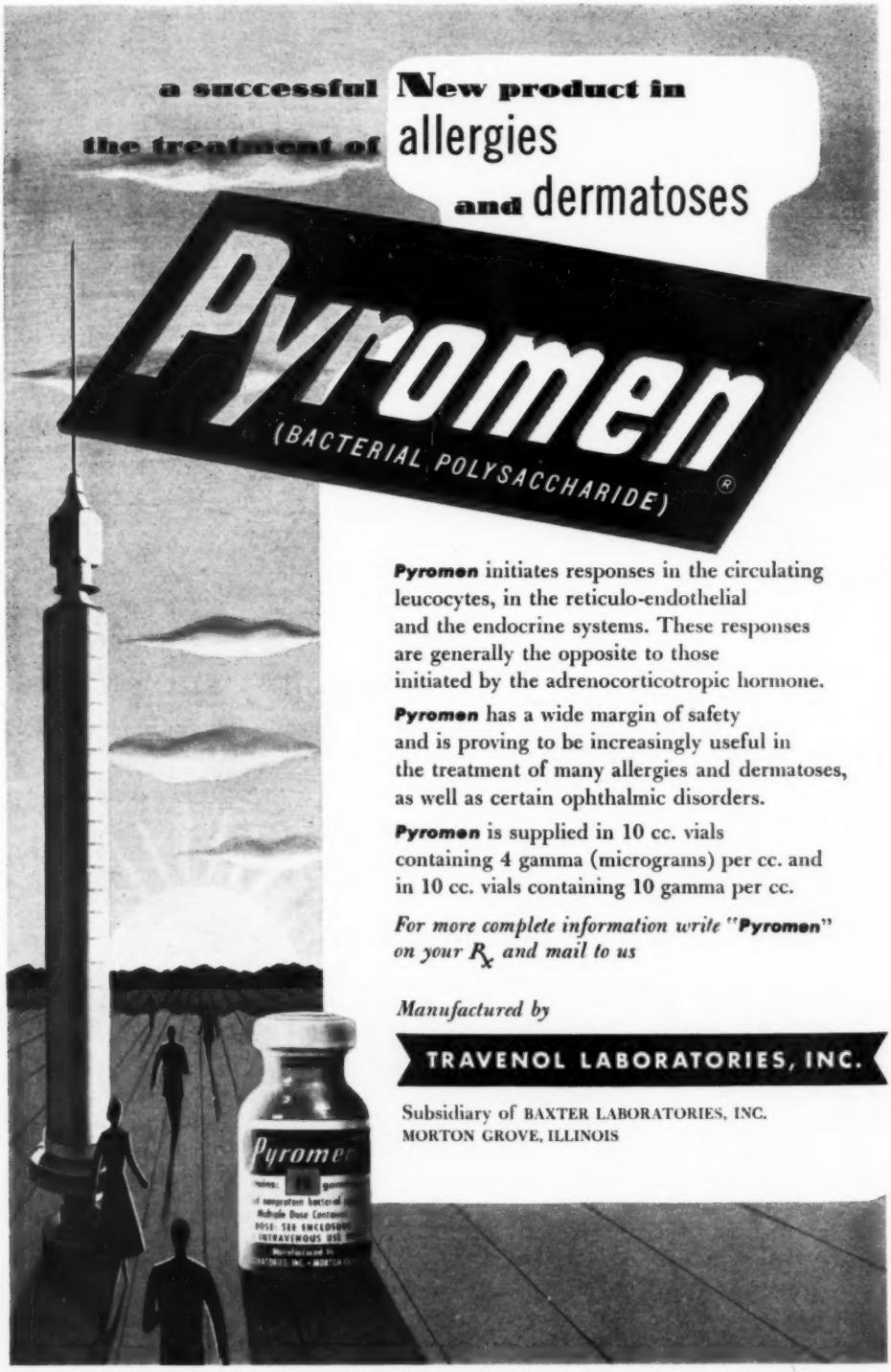
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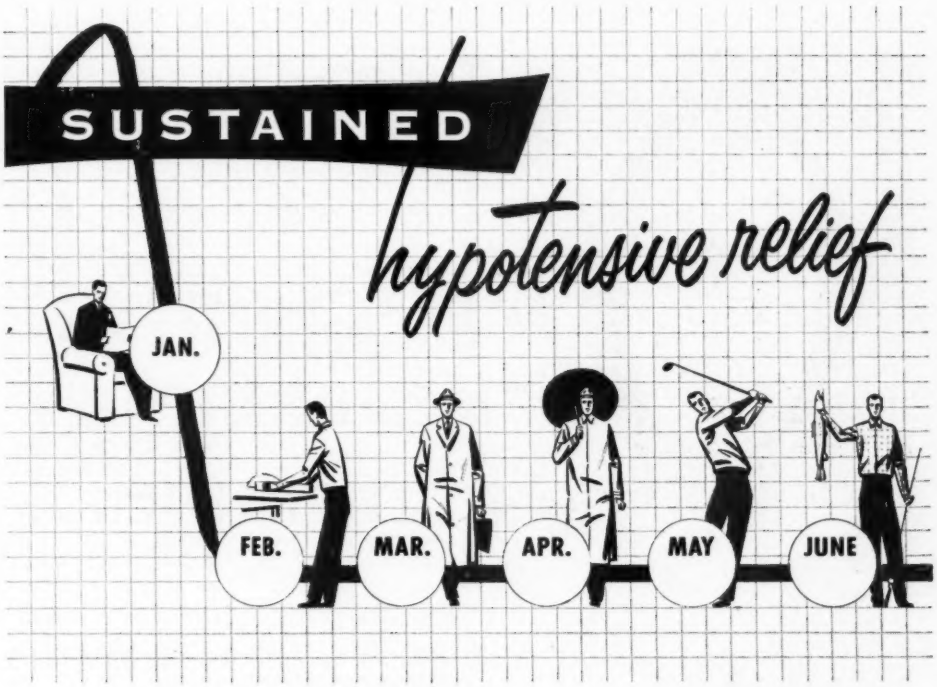

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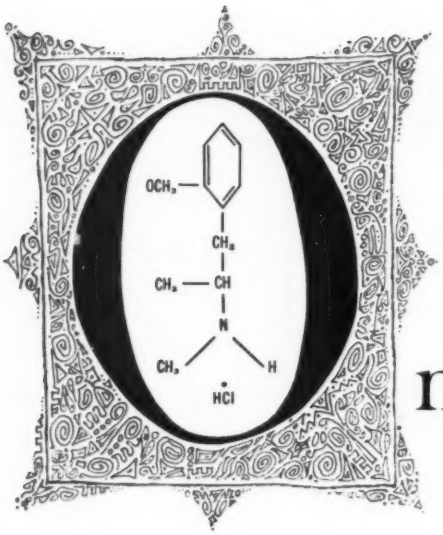

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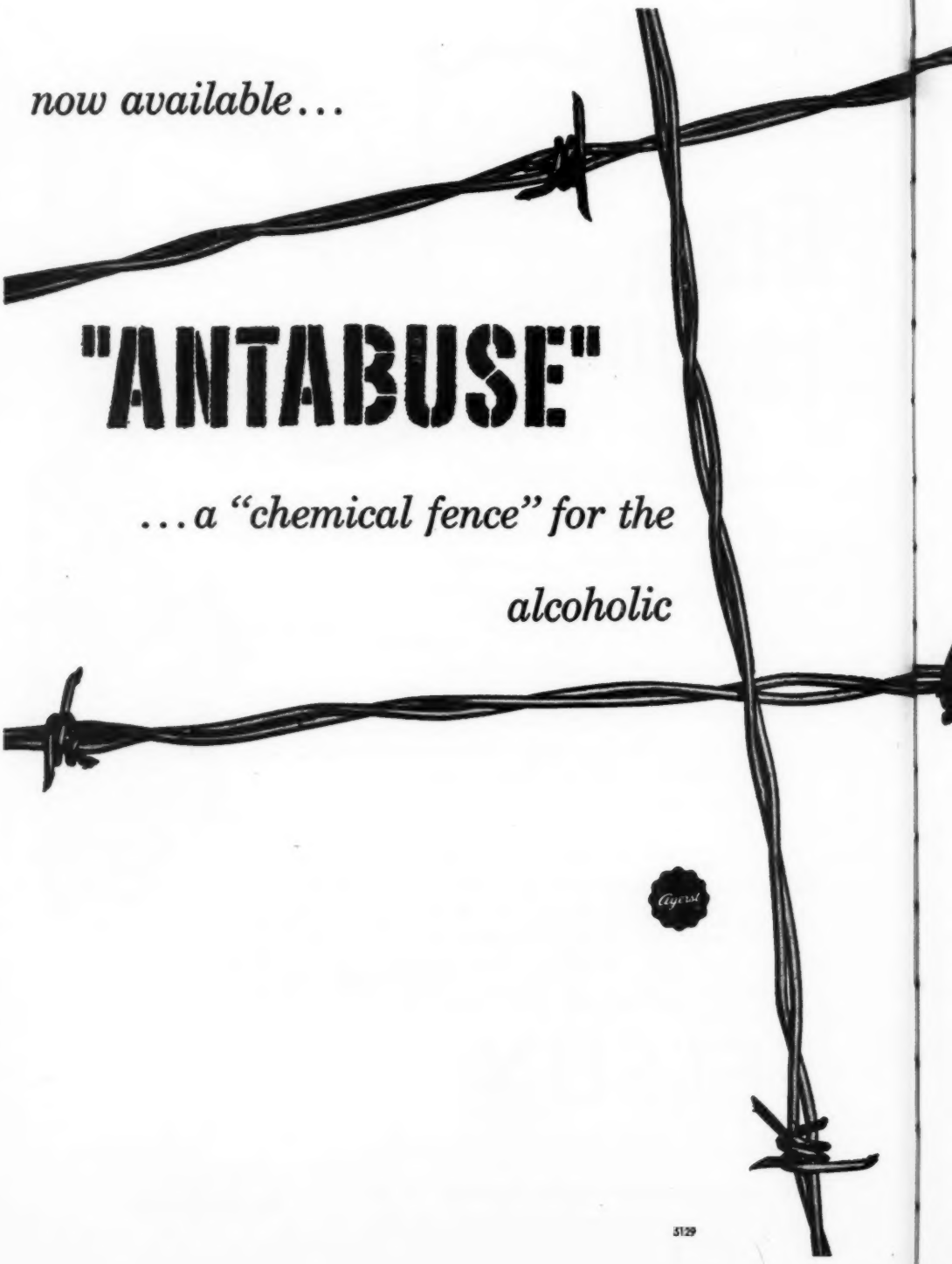

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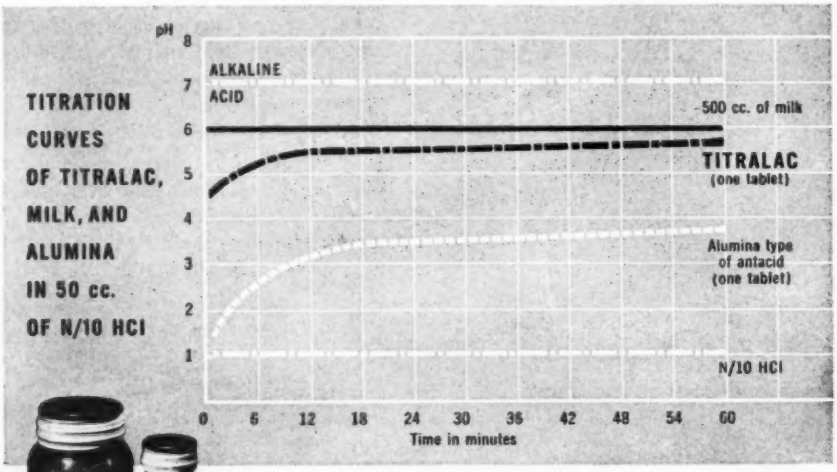

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1. Rossett, N. E., and Flexner, J.: Ann. Int. Med. 18: 193 (1944). 2. Freezer, C. R. E.; Gibson, C. S., and Matthews, E.: Guy's Hosp. Reports 78: 191 (1928). 3. Aaron, A. H.; Lipp, W. F., and Milch, E.: J. A. M. A. 139: 514 (Feb. 19) 1949. 4. Kirsner, J. B., and Palmer, W. L.: Illinois M. J. 94: 357 (Dec.) 1948. 5. Kimball, S.: in Practice of Medicine (Tice). Hagerstown, Md., W. F. Prior Company, Inc., 1948; p. 210. 6. Special Article: M. Times 76: 10 (Jan.) 1948.

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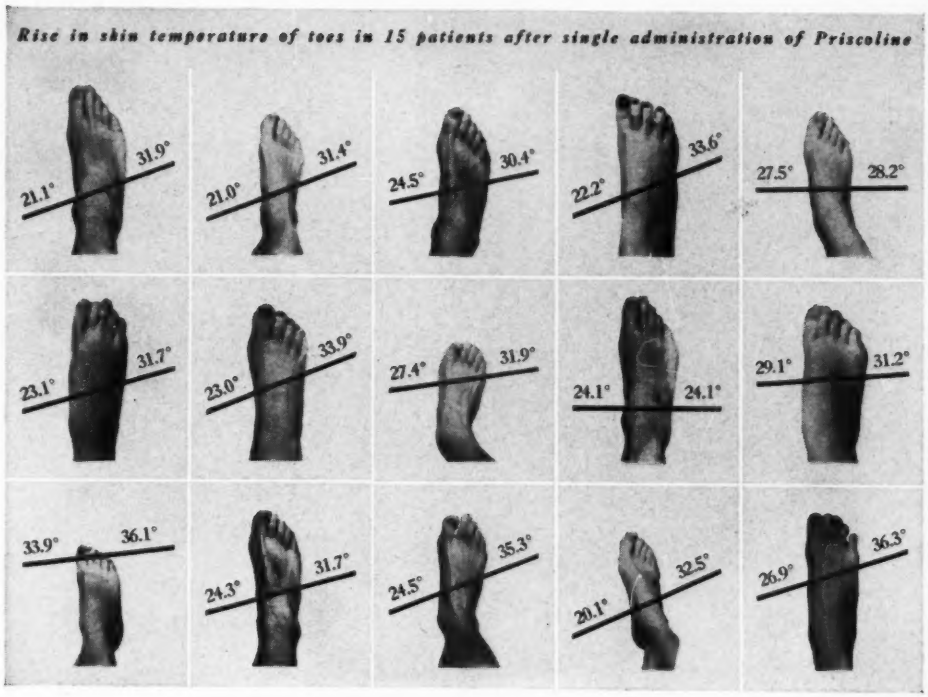

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KWELL OINTMENT

Kwell Ointment offers the therapeutic virtues of Kwell Lotion in a pleasantly scented vanishing cream base. It is useful especially in the treatment of scabies in younger children where prolonged skin contact must be maintained. Supplied in 2 ounce and 1 lb. jars.

C.S.C. Pharmaceuticals

A DIVISION OF COMMERCIAL SOLVENTS CORPORATION, 17 EAST 42ND STREET, NEW YORK 17, N.Y.

in functional G.I. *distress*

though findings are negative, patients remain positive of their many symptoms – belching, flatulence, nausea, indigestion and constipation.

prompt and effective relief

can be given most of these patients by prescribing *Decholin Belladonna* for alleviating spasm and stimulating liver function.

DECHOLIN® with BELLADONNA

reliable spasmolysis

The belladonna component of *Decholin/Belladonna* effectively relieves pain due to spasm and incoordinate peristalsis, and facilitates biliary and pancreatic drainage through relaxation of the sphincter of Oddi.

improved liver function

Dehydrocholic acid *(Decholin)*, the most powerful *hydro*choleretic known, increases bile flow, flushes the biliary tract with thin fluid bile and provides mild laxation without catharsis.

DOSAGE

One or, if necessary, two *Decholin/Belladonna* Tablets three times daily.

COMPOSITION

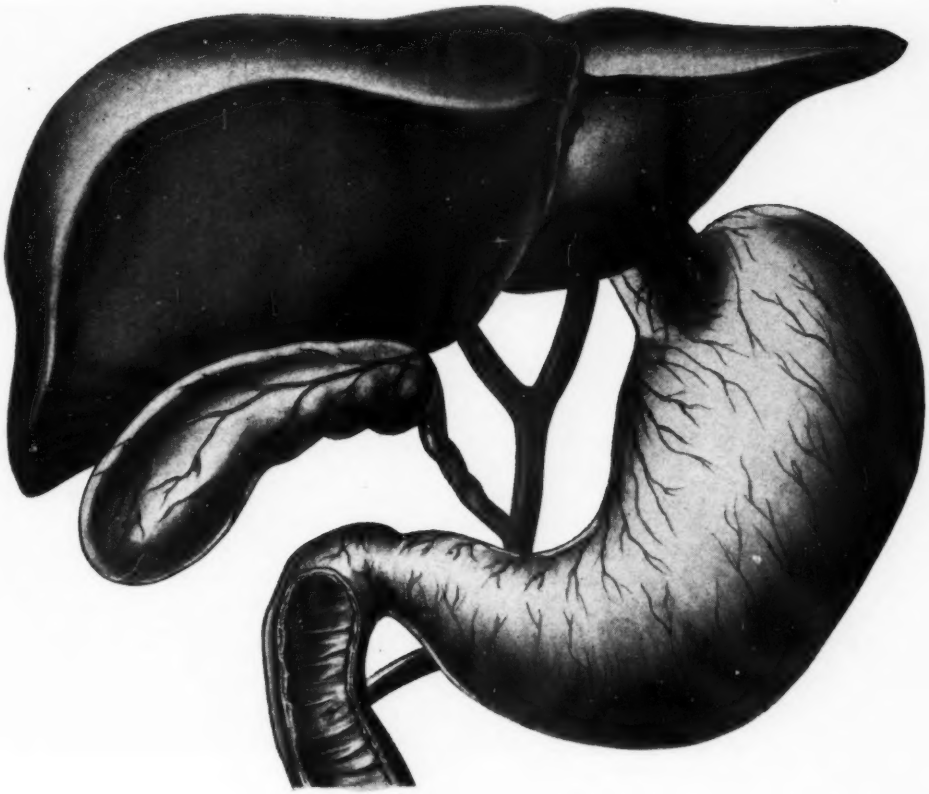
Each tablet of *Decholin/Belladonna* contains *Decholin* (brand of dehydrocholic acid) 3¾ gr., and ext. of belladonna, 1/6 gr. (equivalent to tincture of belladonna, 7 minims). Bottles of 100.

AMES

AMES COMPANY, INC · ELKHART, INDIANA

Ames Company of Canada, Ltd., Toronto

DB-1



Possessing a definite hydrocholeretic action

KETOCHOL®

► Stimulates hepatic function thereby increasing the flow of bile

► Promotes biliary tract drainage, and

► Alleviates gallbladder stasis—

the *desired purposes* of gallbladder therapy.

KETOCHOL—*the 4 bile acids normally found in bile in oxidized (Keto) form.*

SEARLE RESEARCH IN THE SERVICE OF MEDICINE

"...much higher hemoglobin concentration at term..."[1]

mol-iron®

with Calcium and Vitamin D

Mol-Iron, molybdenized ferrous sulfate, is the most effective form of oral iron therapy known.*

The routine administration of supplemental amounts of molybdenized ferrous sulfate for the last trimester produces "... a much higher hemoglobin concentration at term than in ... control patients."[1]

Capsules, bottles of 100.

For nutritionally complicated iron deficiency states

mol-iron®

with Liver and Vitamins

—provides generous amounts of elemental iron and dried **whole** liver; all essential B vitamins, **including B_{12}.** Capsules, bottles of 100.

Also available: Mol-Iron Tablets, Mol-Iron Liquid, Mol-Iron Drops. White Laboratories, Inc., Kenilworth, N. J.

1. Dieckmann, W. J., et al.: Am. J. Obstet. & Gynecol. 59:442, 1950.

*Full bibliography available upon request.

White's

The Right Combinations in

BILE ACID THERAPY

Optimum purity of DOXYCHOL-K and DOXYCHOL-AS enables the physician to obtain predictable end results in bile acid therapy.

Both products represent truly therapeutic formulae, since the ingredients of each exert specific action, and are present in full therapeutic amounts.

DOXYCHOL-AS is indicated where initial treatment requires hepatic stimulation, plus spasmolysis and sedation.

DOXYCHOL-K is ideal for continuation therapy over prolonged periods. It contains no antispasmodic nor sedative, but provides the same quantities of unconjugated bile acids with identical hydrocholeretic effect.

DOXYCHOL-K TRADEMARK . . . Each tablet contains: Ketocholanic acids, 3 gr. (derived from oxidized pure cholic acid, and containing approximately 90% dehydrocholic acid); Desoxycholic acid, 1 gr.

DOXYCHOL-AS TRADEMARK . . . Each tablet contains: Phenobarbital, 1/8 gr. (Warning: May be habit forming); Atropine Sulfate, 1/400 gr.; Hyoscyamine Hydrobromide, 1/400 gr.; Desoxycholic Acid, 1 gr.; Ketocholanic Acids, 3 gr. (derived from oxidized pure cholic acid, and containing approximately 90% Dehydrocholic Acid).

Both products available in bottles of 100, 500 and 1000 tablets.

Write Dept. **25M** for literature

BREON

George A. Breon & Company

Manufacturing Pharmaceutical Chemists

1450 BROADWAY NEW YORK 18, N. Y.

to overcome smooth-muscle spasm...

to allay anxiety...

to help combat depression...

to promote restful sleep

BELBARB

TRADEMARK

- Provides the recognized sedative action of ***phenobarbital***

complementing

- the antispasmodic effect of ***belladonna alkaloids***

Four dosage forms...for individualized therapy

	Phenobarbital	Belladonna Alkaloids	Supplied
BELBARB* Tablet #1 per tablet	¼ gr.	hyoscyamine, atropine, and scopolamine in fixed proportion, approximately equivalent to Tr. Belladonna, 8 min.	Bottles of 100, 500, and 1,000 tablets
BELBARB Tablet #2 per tablet	½ gr.		Bottles of 100, 500, and 1,000 tablets
BELBARB Capsules per capsule	¼ gr.		Bottles of 100, 500, and 1,000 capsules
BELBARB Elixir per fluidrachm (4 cc.)	¼ gr.		Bottles containing 6 fl. oz., 1 pt., and 1 gal.

CCH

EFFECTIVE...SAFE...SPASMOLYSIS AND SEDATION

Literature and samples on request.

CHARLES C. HASKELL & CO., INC.

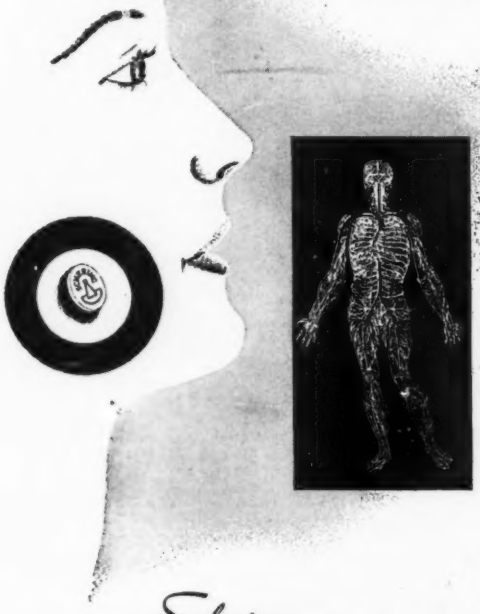
RICHMOND, VIRGINIA

*Trademark of Charles C. Haskell & Co., Inc.

hormones
by the
buccal route

Optimal utilization with minimal dosage
Effectiveness approximating parenteral therapy
Convenience of administration
Economy — cost per milligram

BUCCAL TABLETS



CORTATE®
Buccal Tablets: 2 mg. Desoxycorticosterone Acetate U.S.P.

ORETON®
Buccal Tablets: 2.5, 5 or 10 mg. Testosterone Propionate U.S.P.

ORETON-M®
Buccal Tablets: 10 mg. Methyltestosterone U.S.P.

PROGYNON®
Buccal Tablets: 0.125 or 0.25 mg. Estradiol U.S.P.

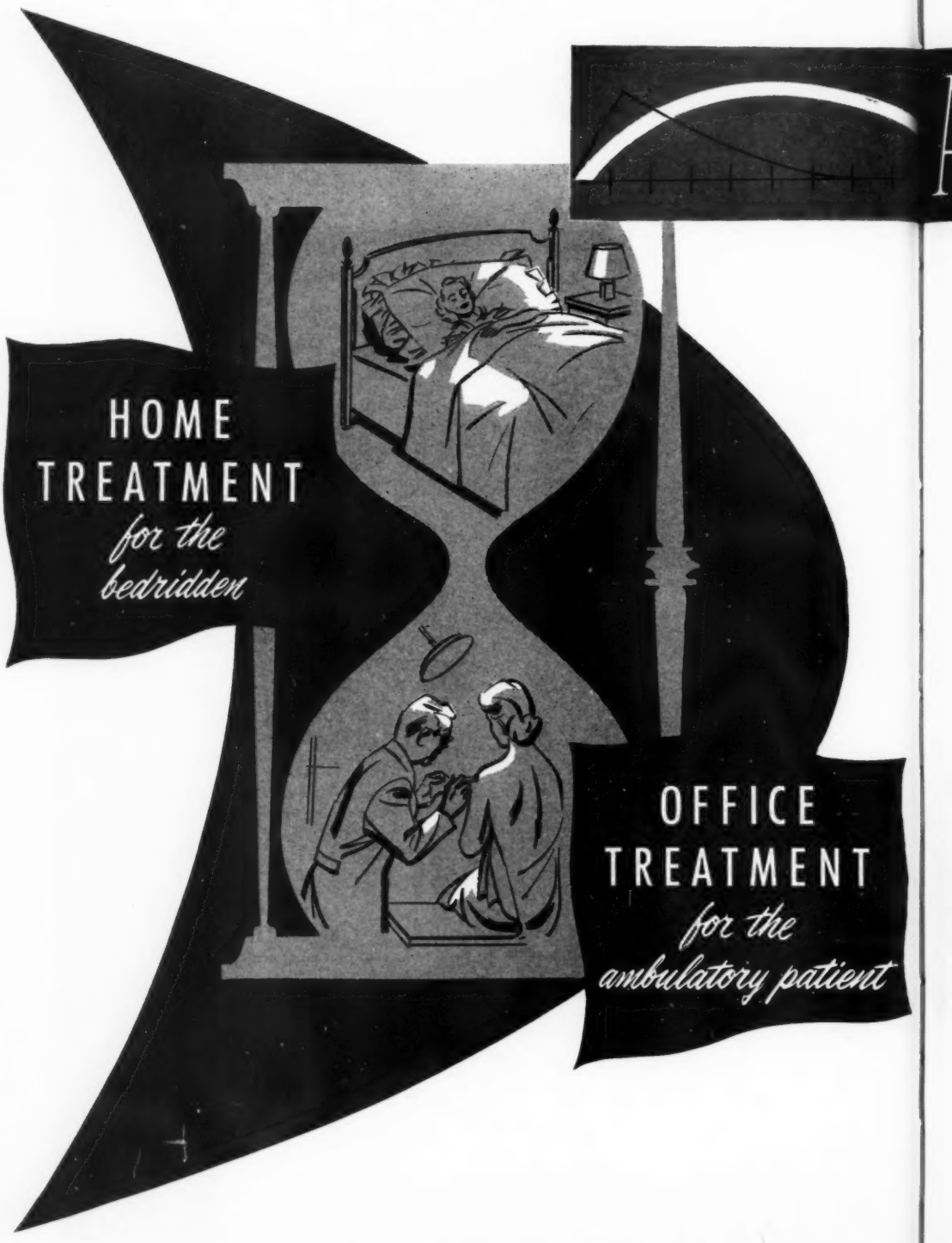
PROLUTON®
Buccal Tablets: 10 mg. Progesterone U.S.P.

All Schering hormones available in Buccal Tablets are dissolved in POLYHYDROL,® a unique *solid solvent* base.

Schering CORPORATION · BLOOMFIELD, N. J.

BUCCAL TABLETS

SCHERING


HOME
TREATMENT
for the
bedridden
OFFICE
TREATMENT
for the
ambulatory patient

ACTHAR* *Gel* IS LONG-ACTING

ACTHAR *Gel*—the new LONG-ACTING repository preparation—simplifies ACTH therapy comparable to the management of diabetes with long-acting insulin. Home or office treatments become readily applicable with substantial economy to the patient. Greatly prolonged therapeutic action and convenience of administration are distinct advantages of ACTHAR *Gel*.

Recent clinical studies have firmly established the recommended dosage of ACTHAR *Gel*. Established dosage for optimum therapeutic effects is important in the everyday use of ACTH in your practice.

Indications: Rheumatoid arthritis, rheumatic fever, acute lupus erythematosus, drug sensitivities, severe bronchial asthma, contact dermatitis, most acute inflammatory diseases of the eye, acute pemphigus, exfoliative dermatitis, ulcerative colitis, acute gouty arthritis, secondary adrenal cortical hypofunction. **Supplied:** 5 cc. multiple dose vial containing 20 I.U. per cc., and 5 cc. multiple dose vial containing 40 I.U. per cc.

*THE ARMOUR LABORATORIES BRAND OF ADRENOCORTICOTROPIC HORMONE (A.C.T.H.)

THE ARMOUR LABORATORIES
CHICAGO 11, ILLINOIS
world-wide dependability
PHYSIOLOGIC THERAPEUTICS THROUGH BIORESEARCH

A MUST in Every

Emergency Bag

Solution

VERILOID*

INTRAVENOUS

.....For Hypertensive Crises

Veriloid Intravenous Solution is an important new emergency drug. For the first time it makes available a purified fraction of Veratrum viride which can be given by vein. This powerful hypotensive agent is capable of dropping the blood pressure to desired or indicated levels within a matter of minutes in a vast majority of patients. It makes possible immediate control of the arterial tension in the conditions in which a continued hypertensive state could readily lead to serious complications or even to death. Thus it finds valuable application in the emergency treatment of hypertensive states accompanying cerebral vascular disease, malignant hypertension, and hypertensive crisis (encephalopathy).

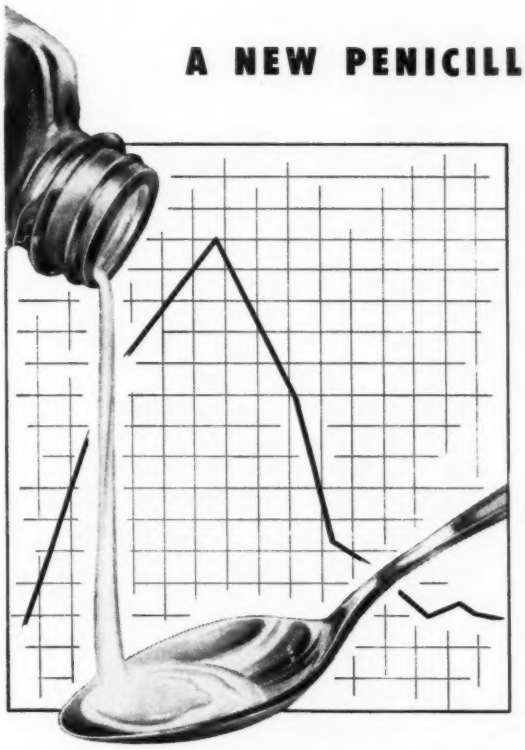
After a satisfactory drop in tension has been achieved, the blood pressure can be controlled subsequently by the administration of suitable oral medication.

The dosage of Veriloid Intravenous Solution must be carefully calculated, and the injection must be given slowly. The leaflet which accompanies the ampules contains comprehensive information on dosage and administration and should be read carefully before therapy is initiated. Veriloid Intravenous Solution, 0.4 mg. of Veriloid standard reference powder per cc., is supplied in 5 cc. and 20 cc. ampules. Detailed literature is available to physicians on request.

*Trade-Mark of Riker Laboratories, Inc.

RIKER LABORATORIES, INC., 8480 Beverly Boulevard, Los Angeles 48, California

A NEW PENICILLIN COMPOUND



READY TO USE BY ORAL ROUTE—
No need to prepare suspension

STABLE FOR 18 MONTHS
at ordinary room temperatures . . . no refrigeration required

VERY PALATABLE
no penicillin taste

DEMONSTRABLE BLOOD LEVELS
readily secured and maintained

SUPPLIED: Bottles of 2 fl. ozs.

BICILLIN differs from other penicillin salts in that it contains 2 moles of penicillin to 1 mole of base.

In clinical effectiveness, it compares favorably with all forms of oral penicillin therapy.[1,2,3] No side effects have been observed.

1. Welch, H., and Putman, L.E.: Personal communication
2. Lepper, M.H., and Dowling, H.F.: To be published
3. Preston, E., and Coriell, L.F.: Personal communication

ORAL SUSPENSION

BICILLIN*

BENZETHACIL

DIBENZYLETHYLENEDIAMINE DIPENICILLIN G WYETH

Wyeth®

Wyeth Incorporated, Philadelphia 2, Pa.

*Trademark

The *Gentarth* formula constitutes a new, direct approach for relief of pain and reduction of swelling and joint inflammation in rheumatoid arthritis. *Gentarth* is non-hormonal in action.

Sodium gentisate has been found to produce favorable results in both rheumatoid arthritis and acute rheumatic fever,[2] possibly because of its inhibiting effect on the hyaluronidase in synovial cavities.[3,4] Inclusion of salicylate, as in the *Gentarth* formula, provides additional analgesic action and enhances effectiveness.

Gentarth tablets also contain succinic acid to protect against increase in prothrombin time—a necessary precaution in prolonged salicylate therapy.

Each tablet contains:

Sodium Gentisate	100 mg.
Raysal . . . . . *(representing 43% Salicylic Acid and 3% Iodine in a Calcium-Sodium Phosphate buffer salt combination)*	325 mg.
Succinic Acid	130 mg.

Dosage: 2 to 4 tablets 3 or 4 times daily (after meals and before bedtime).

Supplied in bottles of 100, 500 and 1,000. Available through all ethical pharmacies.

1. *Boyd, L.J., Lombardi, A.A., and Svigals, C.: New York Med. College Bull.*, 13:91, 1950.
2. *Meyer, K. and Ragan, C.: Mod. Concepts of Card. Disp.*, 17:2, 1948.
3. *Quick, A.J.: J. Biol. Chem.*, 101:475, 1933.
4. *Guerra, J.: J. Pharm. Exper. Ther.*, 87:1943, 1946.

Serving the medical profession for nearly a third of a century

RAYMER

PHARMACAL COMPANY Pharmaceutical Manufacturers
Jasper and Willard Streets, Philadelphia 34, Pa.

to restore
the Arthritic patient
to

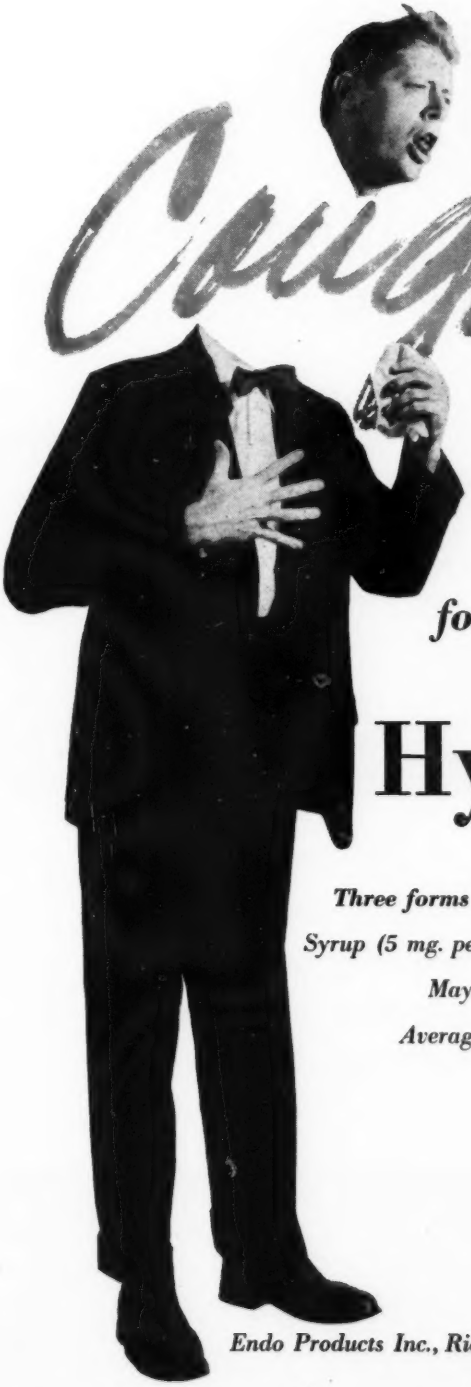
pain-free activity

"The best results were obtained in patients . . . treated with sodium gentisate and salicylate"[1]

Tablets

GENTARTH

The original preparation containing sodium gentisate,
an inhibitor of the spreading factor enzyme, hyaluronidase



Coughing your head off!

ACCEPTED COUNCIL ON PHARMACY AND CHEMISTRY AMERICAN MEDICAL ASSOCIATION

for effective cough therapy

Hycodan® BITARTRATE

(Dihydrocodeinone Bitartrate)

Three forms available: Oral Tablets (5 mg. per tablet), Syrup (5 mg. per teaspoonful), Powder (for compounding). May be habit forming; narcotic blank required. Average adult dose 5 mg. Literature on request.

Endo®

Endo Products Inc., Richmond Hill 18, N.Y.

250 mg. of pure Crystalline Terramycin per teaspoonful (5 cc.). Supplied in a combination package consisting of a vial containing 1.5 Gm. Crystalline Terramycin . . . and a bottle containing 1 fl. oz. of flavored diluent.

ANTIBIOTIC DIVISION • CHAS. PFIZER & CO., INC.
Brooklyn 6, New York

Pfizer

For all patients, young and old,
who prefer effective
broad-spectrum therapy

. . . *in the best of taste*

oral
suspension

Delicious raspberry-flavored preparation made possible by the unique physical properties of well-tolerated Terramycin— for prompt, effective and palatable therapy of a wide range of infections.

world's largest producer of antibiotics

TERRAMYCIN
PENICILLIN
STREPTOMYCIN
DIHYDROSTREPTOMYCIN
POLYMYXIN
BACITRACIN

CITRUS JUICE ASSAY

Long welcomed in home and institutional kitchens for its convenience, economy and flavor—*frozen* citrus is now acknowledged the "nutritive equal" of fresh. The Council on Foods and Nutrition of the American Medical Association has declared* that—under modern processing methods—approximately 98 percent of the vitamin C content can be retained in the frozen concentrated juice. And, when properly stored (below its freezing point), there is practically no loss of vitamin C. Frozen citrus can thus be confidently recommended for diets at all ages, including infancy.

*J.A.M.A. 146:35, 1951.

FLORIDA CITRUS COMMISSION • LAKELAND, FLORIDA

FLORIDA *citrus*

ORANGES • GRAPEFRUIT • TANGERINES

Pregnancy–

Lactation

PRECALCIN®
CAPSULES

PATIENT-ACCEPTANCE assured because the colorful two-tone, easy-to-swallow capsules, plus the dry powder "fill", make PRECALCIN continuously agreeable to all patients. There is no fish-oil aftertaste.

DOSAGE: 1 PRECALCIN Capsule three times daily, or more as prescribed.

AVAILABLE: Bottles of 100, 500, and 1,000 capsules.

Each capsule contains:

Dicalcium Phosphate (Anhydrous)	0.45 Gm.
Bone Phosphate*	0.15 Gm.
Vitamin A (Ester)	2,000 U.S.P. Units
Vitamin D (Irradiated Ergosterol)	400 U.S.P. Units
Thiamine Hydrochloride	3.00 mg.
Riboflavin	2.00 mg.
Niacinamide	10.00 mg.
Ascorbic Acid	30.00 mg.
Ferrous Gluconate	45.00 mg.
*Fluorine content	0.07 mg.

Walker VITAMIN PRODUCTS, INC. *Mount Vernon, N. Y.*

in rheumatic disorders . . .

Tolserol

Squibb 3-o-toloxy-1,2-propanediol

relieves stiffness and discomfort
permits increased range of motion

Oral dosage in rheumatic disorders and allied conditions:

Initial dose is 1.5 to 2.0 Gm. or more, depending on the weight of the patient. To be followed by 0.5 to 0.75 Gm. every three hours as long as discomfort continues.

Tolserol should be given after meals. If given between meals, the patient should drink ⅓ glass of milk or fruit juice before taking Tolserol. This is desirable because the administration of large doses when the stomach is empty has caused some weakness, giddiness, syncope, or gastric distress in a few patients. Some clinicians, however, prefer to give Tolserol when the stomach is empty in order to obtain a rapid effect; in such cases, the patient should be under observation.

Supplied: Tablets, 0.5 Gm. and 0.25 Gm., bottles of 100 and 1,000; Capsules, 0.25 Gm., bottles of 100 and 1,000; Elixir, 0.1 Gm. per cc., pint bottles; Intravenous Solution, 2%, 50 cc. and 100 cc. ampuls.

SQUIBB

"TOLSEROL" (REG. U. S. PAT. OFF.) IS A TRADEMARK OF E. R. SQUIBB & SONS.

normal activity

for the hypertensive patient

To keep arterial pressure at safe levels, conservative medical management demands a multiple approach---vasodilation, mild diuresis and sedation, and as a prophylactic measure, maintenance of capillary integrity with Rutin and Ascorbic Acid.

The Semhyten formula is designed for this logical multiple approach.

Each capsule contains

Phenobarbital	1/4 gr.	(15 mg.)
Mannitol Hexanitrate	1/2 gr.	(30 mg.)
Theophylline	1 1/2 gr.	(0.1 Gm.)
Rutin		10 mg.
Ascorbic Acid		15 mg.

Semhyten

S.E.Massengill

Professional literature available. Bristol, Tenn

Bellaspro brings prompt and effective relief from the common aches and -algias . . . turning what might have been a wasted, pain-ridden day into one of comfort and accomplishment.

For relief of headaches, dysmenorrhea, neuralgia, myalgia, sciatica, lumbago:

BELLASPRO®

Belladonna Alkaloids	0.0714 mg.
Equivalent in alkaloid content to 3.8 minims Belladonna Tincture	
Caffeine	½ gr.
Acetophenetidin	2½ gr.
Acid Acetylsalicylic	3½ gr.

Supplied in bottles of 100, 500 & 1000 tablets

BELLASPRO® *with Codeine

No. 1 with ¼ gr. codeine phosphate
No. 2 with ½ gr. codeine phosphate
Supplied in bottles of 100 and 500 tablets
*Narcotic order form required

Rationally formulated for rapid relief of pain

VANPELT & BROWN, INC. • *Pharmaceutical Chemists* • **RICHMOND, VIRGINIA**

pains
of angina pectoris
and other vascular spasms are
preventable
with

PAVERIL PHOSPHATE

(DIOXYLINE PHOSPHATE, LILLY)

Useful both as a vasodilator and as an antispasmodic, 'Paveril Phosphate' (Dioxyline Phosphate, Lilly) is especially valuable in the control of angina pectoris, coronary occlusion, and peripheral or pulmonary embolism. 'Paveril Phosphate' has even a wider margin of safety and still greater freedom from side-effects than papaverine, which it resembles therapeutically. Furthermore, since it does not cause addiction and is not a constituent of opium, this useful synthetic may be obtained conveniently without the bother of narcotic forms. Supplied in tablets, 1 1/2 grains (0.1 Gm.) and 3 grains (0.2 Gm.).

Detailed information and literature on 'Paveril Phosphate' are personally supplied by your Lilly medical service representative or may be obtained by writing to

ELI LILLY AND COMPANY · Indianapolis 6, Indiana, U.S.A.

IN VAGINAL AND CERVICAL SURGERY

Furacin Vaginal Suppositories are being used preoperatively to eradicate accessible bacterial infections of the cervix and vagina.

Postoperatively, following hysterectomy or conization of the cervix, their use facilitates primary healing by controlling the surface infection. Likewise, they can decrease greatly the slough, drainage and malodor.

Furacin is stable at body temperature —remains effective in the presence of exudates—is bactericidal to a wide variety of gram-negative and gram-positive pathogens.

Furacin® Vaginal Suppositories

TO DECREASE DRAINAGE
TO MINIMIZE MALODOR
TO FACILITATE HEALING

Furacin Vaginal Suppositories contain Furacin 0.2%, brand of nitrofurazone N.N.R. in a base which is self-emulsifying in vaginal fluids and which clings tenaciously to the mucosa. Each suppository is hermetically sealed in foil which is leak-proof even in hot weather. They are stable and simple to use.

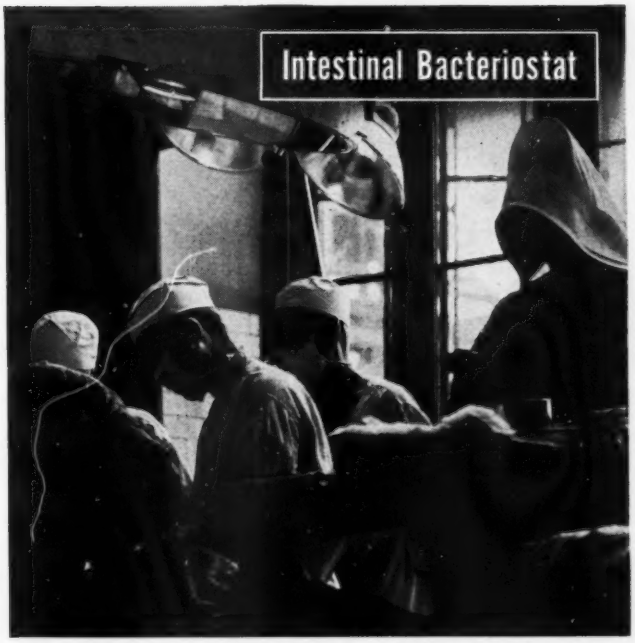
These suppositories are indicated for bacterial cervicitis and vaginitis, pre- and postoperatively in cervical and vaginal surgery.

Literature on request

EATON LABORATORIES Inc.
NORWICH, NEW YORK

The NITROFURANS
A unique class of antimicrobials

Medication reduces risk of Peritonitis



Improved surgical technics have lowered the risk of peritonitis greatly; preoperative administration of SULFASUXIDINE® reduces it even further; and postoperative use of this highly efficient bacteriostat speeds and simplifies convalescence.

SPEEDS CONVALESCENCE

Description: Relatively nontoxic; sparingly absorbed into blood; rapidly excreted by kidneys. Maintains high bacteriostatic concentration in bowel.

Indications: (1) Before intestinal surgery, to minimize risk of peritonitis; afterward, to speed and simplify recovery. (2) Ulcerative colitis. (3) Bacillary dysentery, acute or chronic, including carrier state. (4) Combats urinary tract infections due to *E. coli*, by lowering enteric bacterial reservoir.

Dosage: Initial, 0.25 Gm. per kilogram of body weight; maintenance, 0.25 Gm. per kilogram per day, 6 equal doses, 4-hour intervals. Supplied in 0.5 Gm. tablets, bottles of 100, 500, 1,000, and (oral) powder, ¼ and 1 lb. bottles.

Sharp & Dohme, Philadelphia 1, Pa.

SULFASUXIDINE®

succinylsulfathiazole

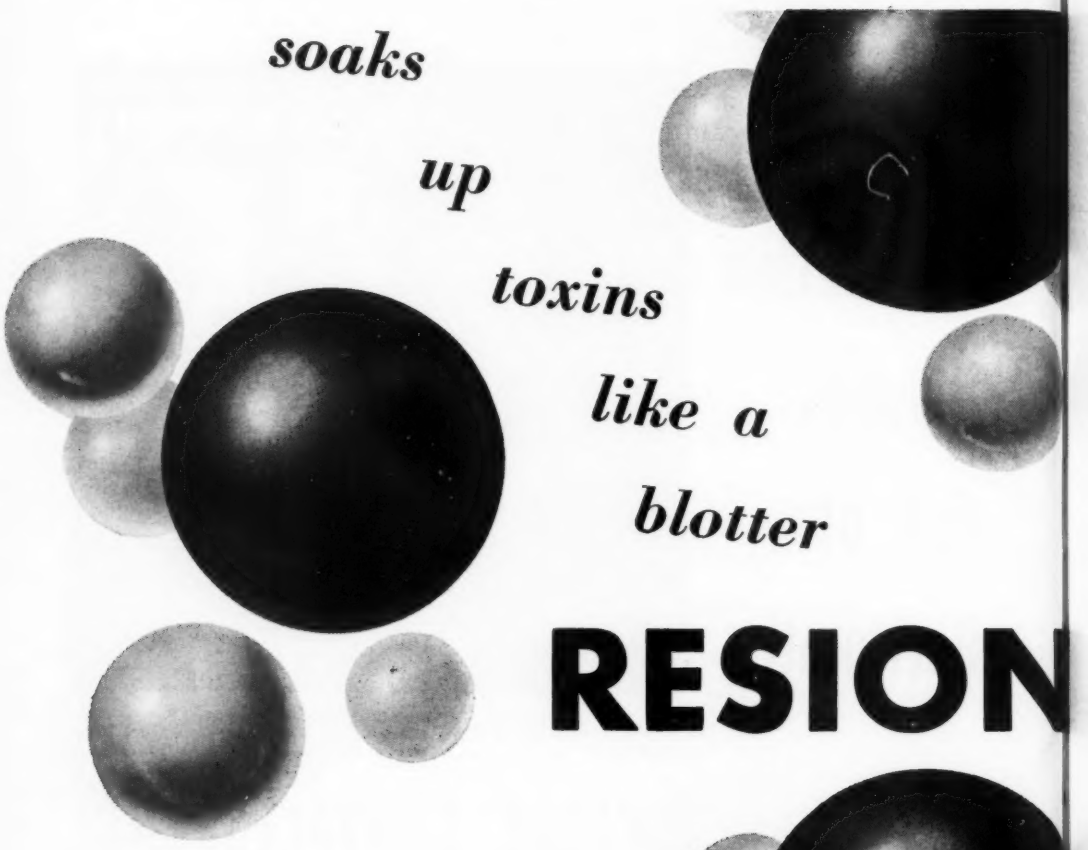
soaks

up

toxins

like a

blotter



RESION

pioneer resin therapy

RESINAT—the ANION exchange resin. Inhibits pepsin. Normalizes hydrochloric acid. Adsorbs acid in the stomach, releases harmlessly in the alkaline small intestine. Indicated in PEPTIC ULCER.

NATRINIL—the CATION exchange resin. For sodium withdrawal. Indicat in CONGESTIVE HEART FAILURE, EDEMATOUS STATES, HYPERTENSIO

In diarrhea, and the nausea of pregnancy —

RESION is indicated wherever diarrhea, food poisoning or a generalized state of gastrointestinal toxicity exists.[1, 2] It is a valuable adjuvant in the treatment of these disorders. It is also of definite benefit in gastroenteritis, flatulence,[1] mucous colitis, infantile diarrhea[2, 3] and in the management of the nausea and vomiting of pregnancy.[4]

RESION is an extremely palatable suspension of special insoluble adsorbent ingredients and is specifically designed to *take up and remove* from the intestinal tract, toxic compounds. The effect is one of selective adsorption and electrochemical attraction.

RESION adsorbs and inhibits the action of many of the products of putrefaction in the intestinal tract and removes substances of endogenous bacterial origin, as toxins.[1, 2, 5, 6]

RESION'S individual constituents exert a mutually additive action:—[6, 7]

Polyamine methylene resin adsorbs toxic bacterial metabolites, such as indole and skatole, and also guanidine, histamine and tyramine.

Sodium aluminum silicate adsorbs the toxic amines—tyramine, cadaverine, histamine; putrescine, guanidine, also indole and skatole. It inhibits the action of lysozyme.[7]

Magnesium aluminum silicate adsorbs lysozyme,[1, 5, 6, 7] cadaverine and other amines resulting from putrefactive processes.

How supplied: **RESION** is supplied in a palatable vehicle:
Bottles of 4 and 12 ounces.

RESION

1 Rollins, C. T., to be published.
2 Joslin, C. L.: Del. St. Med. J. **25**:35, 1950.
3 Quintos, F. N.: Philippine J. of Med. **26**:155, 1950.
4 Fitzpatrick, V. P.; Hunter, R. E., and Brambel, C. E.; Am. J. Diges. Dis. **18**:340, 1951.
5 Meyer, K.; Prudden, J. F.; Lehman, W. L. and Steinberg, A.: Am. J. Med. **5**:482, 1948.
6 Martin, G. J.: Am. J. Diges. Dis. **18**:16, 1951.
7 Moss, J. N. and Martin, G. J.: Am. J. Diges. Dis. **15**:412, 1948.

THE NATIONAL DRUG COMPANY • Philadelphia 44, Pa.

safe...dependable...effective

in hypertension

Sympathectomy patients "have done extremely well" on thiocyanate therapy as shown by new studies

Extensive new studies[1, 2] demonstrate conclusively that sympathectomy for relief from hypertension is an "effective treatment" which favorably alters blood pressure levels and the clinical course of the disease. Patients previously resistant to sulfocyanate therapy "have done extremely well when operated on and given thiocyanates."
In the treatment of hypertension in general "the thiocyanates have been the best and most effective drug when properly employed,"[2] reducing pressure levels substantially in a satisfactory number of patients.

HAIMASED (TILDEN)

thiocyanate therapy at its best

All the hypotensive efficacy of the Sulfocyanates (Thiocyanates) are available in HAIMASED in the first and finest Sulfocyanate liquid made in the United States. HAIMASED is stable, palatable, easy to take, sugar-free.

Each 100 cc. of HAIMASED represents 4.4 Grams (20 grains to the fluid ounce) of Sodium Sulfocyanate.

1. DAVIS, L., ET AL.: ANNALS OF SURGERY 133:867, 1951.
2. DAVIS, L.: POSTGRADUATE MED. 9:321, 1951.

Samples and reprints upon request.

The TILDEN Company

New Lebanon, N. Y. St. Louis 3, Mo.

OVER 125 YEARS OF FAITHFUL SERVICE TO THE MEDICAL PROFESSION . . . BY THE OLDEST MANUFACTURING PHARMACEUTICAL HOUSE IN AMERICA. FOUNDED 1824.

bile should be brisk business

not cholagogue
not choleretic
but hydrocholeretic

In nonobstructive biliary disease, stimulation of a large volume of bile with a high water content for copious flushing of the biliary tract is essential. To complement the hydrocholeresis, biliary duct and sphincter of Oddi relaxation is vital. Cholan-HMB contains dehydrocholic acid (250 mg. or 3¾ gr. per tablet)—the most potent, least toxic hydrocholeretic known. It also contains the safe, selective spasmolytic, homatropine methylbromide (2.5 mg. or 1/24 gr.)—with phenobarbital (8 mg. or 1/8 gr.).

MALTBIE... *first to develop American process for converting crude viscous ox-bile into chemically pure dehydrocholic acid.*

Chart shows increase in biliary secretion after injection of sodium dehydrocholate, as compared to various bile salts.

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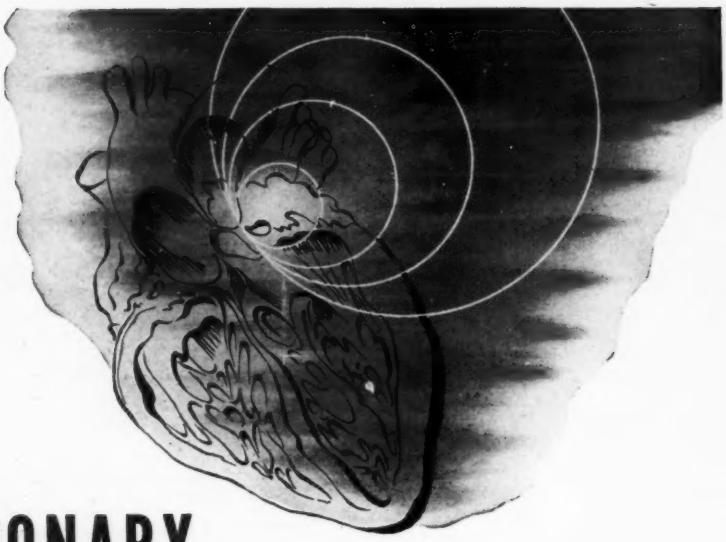

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THE SOUTHERN DOCTOR*

By CURTICE ROSSER, M.D., F.A.C.S.†
Dallas, Texas

We celebrate tonight a historic occasion. Early in this century a few hundred physicians, assembled in Chattanooga, Tennessee, brought into being an association of Southern doctors designed to offer "congenial relationship" to those it served, whose programs would deal with diseases peculiar to the Southern States and would present to the world the results of the research and clinical experience of the splendid body of men composing the ranks of the medical profession of the South.[1]

What manner of men were these, our professional forbears, whose planning so long ago lead quickly to a great and useful organization covering the entire South, gathering here in annual session this day? What high hopes and fragrant memories activated them; what ambitions for those of us who were to follow?

We know that these were men with pride in the long cavalcade of romance and achievement in which their ancestors had marched and the splendor and grace of the civilization they had established. We hear much of the Pilgrim Fathers, but do not forget that the Cavalier as well as the Puritan was on this continent in its early days and, in the words of Henry W. Grady,[2]

"While the Puritans of New England were cutting off men's ears for courting a girl without her parents' consent and forbidding men to kiss their wives on Sunday, the Cavalier of the South was courting everything in sight and the Almighty vouchsafed great increase to his colonies."

Thus, there first began a divergence in type and temperament from other sections, to which were added the mellowing influence of a semi-tropical environment and an agrarian, as contrasted with an industrial, plan of life.

It follows that these men not only possessed pride of ancestry but a fervid love for their section, for its green hills and fertile valleys, the homes of their childhood. Historians[3] tell us that this affection for the specific region had been sharpened and accentuated through the years by the pressure of adverse opinion from without.

Southern statesmen had seen their region, first dominant, decline gradually to a subordinate position. As their influence over national affairs waned, Southerners invented defences against what they regarded as Northern political ruthlessness and fanaticism. A natural sequence was that their allegiance to their own section increased.

Their first response to the vigorous verbal onslaught of the North was one of startled amazement. In defense, they denied the validity of Northern criticisms and evolved a remarkable apologia for virtually every aspect of the Southern way of life.[3] John C. Calhoun of South Carolina, who championed the "peculiar institutions" of the South in the United States Senate, appealed to all sides whether his region was "not equal in virtue, intelligence, patriotism and all the high qualities which adorn our nature" with other parts of the nation and died on the Senate floor while fighting its battles with the words upon his lips:

"The South! The poor South! God knows what will become of her!"

Sweet are the uses of adversity! Under the impact of a long train of bitter criticism of their region and with the realization that the power of their opponents was growing there arose in the South, long before the Civil War, a thing which was part reality, part dream which served as a compensation and solace.

"The ancient Hebrews looked back to the Garden of Eden and the Greeks forward to a Golden Age. The ante-bellum defenders of the South, rare among mortals, knew that their own age was the golden age. Even if the idealized portrait overlooked all imperfections, it was to be a strong and living force in the years ahead.

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*President's Address, Southern Medical Association, Forty-Fifth Annual Meeting, Dallas, Texas, November 5-8, 1951.

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This vision of a perfect land supplied a substantial element in the construction of the romantic legend about the Old South. In the nearer future, it was to give the Confederate soldier something to die for."[3]

And so in Chattanooga they dreamed occasionally of the days before the war, a nostalgia which we share with them, and loved their Southland the more, as we do.

The Southern doctor, supported by pride of ancestry and love of his land, could also glory in the service and achievement of his predecessors in the profession. He could recall Marion Sims bringing from Alabama to the East and to Continental Europe new and saving surgical help for all womankind, and Ephriam McDowell in the little town of Danville, Kentucky, who, armed with training and courage and using a kitchen as an operating amphitheatre, first demonstrated that ovarian tumors could be safely removed. And that modest man, Crawford Long—

A Georgia surgeon who conquered pain,
Forged his weapon, boldly drew it,
Found out ether's power, and used it.
Got mankind a marvelous gain;
Taught few followers how to do it,
Won the laurel, and refused it?

Had this man no time for dreams?
Hand or mind for generous fame?
Wit nor will for worldly schemes?
Hating praise? Or shunning blame?

Yet of him, "One thing I know,"
(Spoke a man cured long ago.)
History reads it, right from wrong:
When the first surgical patient slept
Etherized from anguish, kept
At peace through pain,
He owed that gain
To the conqueror: Crawford Long.[4]

By birth and environment the Southerner was conservative in thought and action. It is extremely fortunate that there are in these states, a body of people with traditional respect for property rights and the established order, not filled, in the words of Millard Fillmore,[5] with that "exuberance of enterprise which causes some individuals to mistake every change for progress." Fortunate because this sectional weight of opinion has served to some degree as a brake on the headlong trend toward a welfare state present in the nation today. Our culture has evolved on a broad base of tolerance but with little encouragement of the mystical and bizarre in religion or in literature. In educational fields that unstable and brittle intellectualism which can be contemptuous of old and honorable institutions simply because they are old and even of the ancient virtues when seen in men of public life has never flourished in this clime.

It is highly improbable that those who inspired this organization, men with this sound background, a classical schooling on which was superimposed training of the most practical and fundamental nature, accustomed to presiding at the solemn occasions of mankind: birth, illness and death, would have been misled by fantastic and revolutionary doctrines urged by nations or parties, would have lost faith in the capacity of a sovereign people to manage its own affairs or forget that nothing is free and that a government has nothing to give except what it takes away from the governed.

Loyalty is a splendid quality and we salute the unswerving devotion of those of the South to their institutions and traditions. True enough, the quality at times may become a bit unreasoning, as for example the present widespread, almost automatic adherence to a party, formerly sympathetic to the concepts and ideals of the South but now, it is feared by many, prisoner of those of a far different idealogy.

Physicians the world over, through training, tradition and precept develop a capacity for one supreme loyalty, faithfulness to those they serve as a profession. How else explain the sad procession of our confreres in the British Isles, unwilling captives chained to the chariot wheels of a still socialistic regime, held captive by their allegiance to the sick they must serve. Because this "Achilles heel" of ours is known and relied upon by those instigating compulsory health insurance, we can only appeal to the friends of all free enterprise to aid us before we are hopelessly contaminated by this spreading European plague.

Here then, were our medical fathers, men of pride of heritage, love of country, glorying in the achievements of those they followed and loyal to their institutions and their profession. What hopes and ambitions did they cherish for those of us privileged to succeed them in their high calling?

May I assume that they would have wished us to possess, as citizens and as doctors, the equnimity extolled by Osler as the supreme attribute of the physician, the bravery essential to meet the challenge of these perilous and uncertain times and the intelligence necessary to serve our people efficiently. Surely, they would join with us in Reinhold Neighburh's prayer, embodying this identical trinity:

"God, give me serenity of mind
To accept the conditions I cannot change
The courage to change those I can
And the wisdom to know the difference."

To these virtues we must add another, the faith without which we may flounder in the morass of anxiety, of war, of almost war, of enemy abroad and enemy at home. Would that each of us could bring to his task the trust exampled in William Cullen Bryant's ode "To a Waterfowl":

"He who, from zone to zone,
Guides through the boundless sky thy certain flight,
In the long way that I must tread alone
Will lead my steps aright."

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DIFFICULTIES IN THE DIAGNOSIS OF CERTAIN GASTRIC LESIONS*

By JOSEPH C. BELL, M.D.
Louisville, Kentucky

Some recent writings, particularly those dealing with photofluoroscopic surveys of the upper gastrointestinal tracts of supposedly healthy persons who had had no particular preparation, give the impression that this examination can be quite simple, the procedures being largely routine and yet highly accurate. It seems obvious that this can be true only in relatively advanced lesions or in a small percentage of the early conditions in which the examiner, largely accidentally, has been fortunate in showing them in profile. Since differential diagnosis of a large majority of gastric lesions must include consideration of the possibility of cancer, it is not enough to diagnose advanced more or less obvious lesions. Our patients are urged to consult their physicians promptly in the event of any upper gastrointestinal disorder of unknown cause, lasting more than from one to three weeks. They are obeying these instructions and as a result our diagnostic problems become increasingly difficult.

In diagnosis in general, a detailed and carefully taken history is the first essential, although as old as the practice of medicine, and new methods of investigation will never supplant it. A thorough physical examination is then indicated and frequently yields invaluable information. Many laboratory investigative procedures available are well known and, when indicated, may be of utmost importance in accurate early diagnosis.

There are two methods of investigation in diagnosis of diseases of the stomach that deserve special consideration, the first being by x-ray and the second, gastroscopy. They are not competitive but supplement each other.

The gastroscopist can see the mucosal surface of a large part of the stomach, and ulcerative lesions and certain others that manifest themselves in the mucosa can be inspected directly, diagnostic accuracy, in many instances, being high. There are so-called "blind" areas, ones that cannot be examined, however, and the mucosa is not involved in a significant percentage of lesions, especially in certain carcinomas that spread beneath the mucosa superficially or deeply, with or without early invasion of the muscularis. Notwithstanding certain limitations, gastroscopy has much to offer as a diagnostic aid and is progressively becoming more widely used.

The x-ray examination is the single most widely used definitive method of investigation in the diagnosis of gastric lesions and, in the hands of a trained, experienced examiner, it is highly accurate. A primary requirement is a brief but pertinent history of the patient's complaints, symptoms and signs, which the examiner may have to secure for himself at the time of examination. Palpation of the abdomen must not be neglected and frequently yields information of value.

Both a detailed and painstaking roentgenoscopic examination and adequate indicated films are essential. Fluoroscopy permits all surfaces of the stomach to be examined both with and without compression, and of utmost importance is the fact that the intrinsic movements of the organ can be observed. The latter is important, for most malignant tumors, even in a very early stage, invade the musculature with resultant loss of intrinsic movements.

As nearly as possible we attempt to record in films all abnormalities seen with the fluoroscope,

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in order that there may be a permanent record available to the examiner and referring physician as well. Greater detail is possible in films than in fluoroscopy and some early lesions may thus be detected which might otherwise be overlooked. In serial films peristaltic activity and evidence of flexibility of the gastric wall are recorded. They show with certainty whether or not any irregularity observed is constant and demonstrate lesions shown only during contraction with partial or almost complete emptying of the part being examined. We consider serial films essential in accurate diagnosis.

The so-called "spot" film, made with varying degrees of pressure over the part being investigated, is now widely used and is generally available in adequately equipped x-ray departments. It is of particular value in the demonstration of lesions that can be shown only when most of the superimposed contrast material has been displaced by controlled localized pressure.

A properly performed x-ray examination of the stomach is not easy or simple. It demands training, experience, ingenuity, detailed observation and a great deal of hard work. This is true, however, in accurate, dependable work in any other branch of the practice of medicine.

Interpretation of findings requires a sound basic knowledge of the manifestations of most, and if possible, all normal variants, of congenital anomalies, and the many other abnormalities, infectious, ulcerative, neoplastic or of other nature, that may affect the part under investigation. The law of probability should ever be kept in mind in that other things being equal, if one lesion occurs ten times as frequently as another, the experienced diagnostician will always choose the former.

In the diagnosis of gastric ulcer the roentgenologic method is highly accurate but there are some ulcers of the fundus, a few of the posterior wall well away from the curvature and shallow, although at times large ulcers, that may be readily overlooked. Some of these may be demonstrated by gastroscopy. Few examiners attempt to differentiate with certainty benign from malignant gastric ulcers but many indicate whether the major characteristics favor one or the other. Here, again, gastroscopy may be of great importance.

Benign tumors of an appreciable size are readily detected by x-ray although their exact nature may not be evident.

Gastritis cannot be diagnosed with a high degree of accuracy by x-ray and here the gastroscopic examination is the method of choice. Much has been written concerning the difficulty of differentiating localized gastritis from cancer. In our experience, by careful fluoroscopic observation of peristaltic activity, by the use of adequate serial films and re-examination when indicated, we have been able to determine which patients have had constant deformities and/or areas in which there has been loss of intrinsic movements. Unfortunately, all cases showing these manifestations in which localized gastritis has been mentioned in differential diagnosis as a possible cause, at operation have had cancer.

Syphilis of the stomach is not accepted as an entity by some but there are abnormalities seen in the stomachs of some syphilitics that are quite characteristic although they may be seen in some other conditions. The manifestations are loss of flexibility and of intrinsic movements in a part or all of the gastric wall, usually accompanied by varying degrees of contracture. The appearance differs in no way from a deep invasive carcinoma of the linitis plastica type. The condition is rare but should be mentioned as a remote possible explanation of changes that could and usually are due to carcinoma. A blood test may not have been done and may prove to be positive. If so a therapeutic test of antiluetic treatment would seem indicated.

An example of the above is as follows:

A white woman of 26 was seen complaining of nausea and loss of twenty pounds in weight. An x-ray examination done February 3, 1948 showed what was obviously a very extensive organic lesion of the stomach thought probably to be due to a diffuse carcinomatosis but the remote possibility of a gastric luetic infection was mentioned. The Wassermann was found to be 4 plus. Antiluetic treatment was instituted and by March 13 the patient had gained twelve pounds in weight and at re-examination the stomach was greatly improved in appearance.

By September 11, 1948, eight months later, the patient was clinically well and had gained twenty-five pounds in weight. At this time the walls of the stomach showed flexibility although somewhat less than normal in the distal half. The Wassermann was then 2 plus instead of 4 as was the case originally.

As has been before stated loss of intrinsic movement is characteristic of most carcinomas but is seen in a few other conditions.

Recently we saw a young man who was recovering from what appeared to be an acute gastric disturbance. He had had large doses of belladonna and sedatives. Upon x-ray examination the stomach was found to

have a fixed irregular outline and there was total loss of intrinsic movements. We recommended discontinuance of all medication and re-examination a few days later. The patient was returned for examination only twenty-four hours later, however, and showed much the same irregularity and loss of peristaltic activity before seen. A diffuse carcinomatosis was then considered a definite possibility but at operation the stomach was found to be normal aside from evidence of a mild recent gastritis. Convalescence was uneventful.

A patient examined by one of my associates recently was considered by him to have a very large pedunculated tumor that filled the middle third of the stomach. The surgeon and your speaker being familiar with the phytobezoars in those who eat persimmons, thought that a bezoar might be the explanation of the mass. The patient then gave us a history of having eaten persimmons shortly before being examined. The associate stood his ground because he could see no evidence of barium between the mass and the gastric wall at one point. At operation the tumor was found to be a very large adenocarcinoma attached to the gastric wall only by a small pedicle.

The diagnosis of some lesions of the fundus of the stomach, in our experience, may be most difficult. Diaphragmatic hernias of various types are probably the most common significant abnormalities seen and seldom offer serious difficulty in diagnosis. Chronic ulcers, usually benign, may be most difficult or impossible to detect. Carcinoma of the fundus is seen not infrequently and may constitute a major diagnostic problem. It results in irregularity in the outline but similar irregularity may have other causes. Kirklin has pointed out that the tumor mass itself may be seen outlined by the gas bubble in the fundus when the examination is done with the patient upright. Moderate dilatation of the distal esophagus demands a careful examination of the fundus of the stomach, carcinoma of the fundus being a common cause. Carcinoma of the fundus need not be and frequently is not accompanied by dilatation of the esophagus however. If near the esophageal orifice, the tumor may cause a cascade-like fall of the contrast material as it enters the stomach and, when present, this is quite characteristic.

Unfortunately, in the fundus of the stomach the gastroscope is of little help and in some instances exploratory operation must be resorted to to determine the nature of certain irregularities demonstrated by other means.

The above illustrates only a few of the many difficulties encountered in the diagnosis of abnormalities of the human stomach. Accuracy in the detection of organic lesions is high although differential diagnosis continues to be a major problem in some instances, particularly in certain tumors.

DISCUSSION (*Abstract*)

Dr. Glenn D. Carlson, Dallas, Tex.—In my opinion there is no greater challenge in diagnostic roentgenology than the search for a gastric lesion. Therefore, we should use every trick in the trade in an attempt to demonstrate one when present.

True enough, some lesions are in evidence at the first glance. A white man presented all the signs of an advanced neoplasm after the first three swallows of barium, irregular narrow lumen, lack of peristalsis, palpable mass and so on. It proved to be inoperable.

In another film of a man, age 68 years, in the right anterior oblique position, no lesion is seen. By placing the patient in the anteroposterior position a large ulcer is noted on the posterior wall, fluoroscopically and on films. If one should limit himself only to certain positions of the stomach, such a lesion might well escape detection. In this case there was no microscopic evidence of malignancy.

A fixed area of narrowing in the distal one-third of the stomach of another case suggested neoplasm. However, the serum test for syphilis was positive, the patient responded to antiluetic therapy and a subsequent roentgen study showed marked improvement.

And finally, a survey of the abdomen before the administration of barium may save one embarrassment. I failed to note the marked degree of gastric enlargement and retained secretion before the meal in a case. As a consequence the patient received far more barium than was justified. Perhaps a scout film would have prevented this mistake.

THE USE OF PROTEIN HYDROLYSATES IN THE THERAPY OF PEPTIC ULCER*

By JEROME S. LEVY, M.D., F.A.C.P.†
Little Rock, Arkansas

There are two questions which are most frequently asked me when I discuss the use of protein hydrolysates. Invariably, the first one is, "How do you get your patients to take it?", and the second one, "Under what circumstances do you use a hydrolysate?" These are logical questions and any discussion of the protein hydrolysates naturally should answer both of them. In selecting a subject for this talk before the Section

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on Gastroenterology, I kept coming back to these two questions, and decided their answers would make a good subject for me. I am not going to present a review of the literature which each of you may make for yourself, but rather to review my own experiences.

My interest in the protein hydrolysates dates to the early part of 1938 during a visit with Elman at Washington University. He reviewed with me the work he and Weiner[1] were to report before the American Medical Association in June of that year. I was impressed with the possibilities of the orally administered, predigested protein as a buffer of gastric acidity as well as a source of protein. Investigators of these products had directed their attention, up to this time, towards their parenteral use as a source of protein for the protein deficient animal and human being. There did not appear to be any reason the hydrolysates could not be given by mouth. Surely, any patient able to absorb food material from the digestive canal would have a readily available supply of protein furnished without taxing his digestive functions. It was necessary to find out whether protein in this form was tolerated by the human stomach. Theoretically, such a predigested protein, in solution, and as made by the hydrolysis of casein, should buffer the gastric acidity in the human stomach. The amino acids, being amphoteric in character, should be adequate buffers of gastric acidity. Yet, would they stimulate more gastric secretion so that their buffering action was nullified? To be of value in gastroenterology, especially in treating peptic ulceration, a satisfactory buffering action was considered essential. Siler and I[2] demonstrated that this is so. We gave a group of medical students 300 cc. of a 10 per cent solution of amigen® in water. Aspirations of the gastric contents demonstrated an adequate buffering of gastric acidity for at least 30 minutes in 45 out of 48 students. In addition, pH determinations were made in 18 of the students. All showed an elevation of the pH of the gastric contents to 4.0 or above for 20 minutes, and in 12 of the 18 the pH was 4.0 or above for 30 minutes; of the other 6, the pH in 5 ranged between 3.5 and 4.0. In only one student was the pH below 3.5 at 30 minutes.

I made additional studies[3] to compare the buffering capacity of intact and predigested proteins. The intact proteins were milk and casein. Twenty patients were studied. In each a good secretory response to an injection of histamine had been demonstrated. The histamine injection was repeated and at the same time the patient was given either a glass of milk, or a glass of 10 per cent casein in water, or a glass of 10 per cent protolysate® in water, aspirating the gastric contents at 10-minute intervals thereafter for 90 minutes. The test was repeated on successive days. Each patient was tested with each substance. I demonstrated that the predigested protein was superior to either milk or casein for at least 30 minutes in all cases, and in a large majority of cases, for as long as 50 minutes. Having obtained this information, I was ready to try to answer the second question.

However, an additional study[4] was made, namely, comparing the buffering by intact and predigested proteins when given hourly throughout the day: milk alone, 10 per cent protolysate® in water, and 10 per cent protolysate® in milk were given to patients in whom histamine had produced an excellent secretory response. Aspirations of the gastric contents were made every 30 minutes. Again, milk failed to buffer gastric acidity as well as the protolysate® solution, but the combination of protolysate® in milk proved an even better buffer, maintaining anacidity throughout the day in all cases. This confirmed the previous studies demonstrating the buffering capacity of the predigested proteins.

In the first report, Siler and I suggested that an ideal use of the protein hydrolysates would be in those cases of massive gastric hemorrhage from whatever cause. In these cases the replacement or regeneration of lost serum protein is important as is adequate buffering of gastric acidity. As my observations progressed it became clear that there was one basic need for the use of the predigested protein, namely: to supply protein to the patient who needed protein. Most individuals are able to digest, absorb, and utilize intact proteins when they are eaten in the ordinary day's run of food. There are some, however, who are unable to digest or absorb their food intake. There are, also, some whose digestive tract, for one reason or another, is already taxed, or so nearly so that the addition of more intact protein would be impractical. For these patients, the protein hydrolysate offers the physician the opportunity to supply a large amount of protein without adding too much bulk, and yet to remain within the digestive capacity of the patient. As an example, 200-300 grams of protein can be given each day by adding a predigested protein to the usual Sippy diet. Many

Sippy diets, as given in the hospitals, contain less than 60 grams of protein per day, and a number of patients with peptic ulcer need much more than this amount per day.

There are four main groups of patients with peptic ulcer who require this additional protein intake. The first group is composed of the cases which Siler and I first suggested, namely, those who had had a massive hemorrhage from the gastro-intestinal tract. I have reported a study[5] of hypoproteinemia following massive gastro-intestinal hemorrhage, and compared the rapidity of protein regeneration in a group of controls with a group receiving an identical diet supplemented with a protein hydrolysate. The controls, 6 in number, were given the usual Sippy diet. In these, the serum protein returned to normal in an average of 19.5 days. In eleven cases 150-200 grams of a protein hydrolysate were added to the Sippy diet. In these, the serum protein returned to normal in an average of 10.2 days. The severity of the hemorrhage was comparable in the two groups.

In addition to the more rapid regeneration of serum protein, the hydrolysate patients on hydrolyzed protein uniformly felt better, and stronger, experiencing an improved sense of well being as compared to the controls. Advancing knowledge of protein requirements has emphasized the need for an increased protein intake during the activity of a repair process in the body. I have observed, in cases of hemorrhage, that it may be necessary to give 3.0-3.5 grams per kilo of body weight to provide sufficient protein for rebuilding of tissue, serum protein, and hemoglobin. In passing, it should be pointed out that sufficient calories in the form of carbohydrate must be given at the same time or the protein hydrolysate will be used for energy requirements rather than protein regeneration and tissue repair.

The malnourished patients make up the second group of ulcer cases needing additional protein. The malnutrition may be easily apparent or may be sub-clinical (but nevertheless present). I have not found it unusual for a patient with a simple, uncomplicated ulcer to have been advised to observe, or to have self-imposed, a very inadequate diet and to have maintained such a diet for a long period of time. When first seen, the effects of this restriction of protein may be very evident. On the other hand, it is not always readily apparent, being disclosed by the demonstration of a mild anemia and a hypoproteinemia. The same circumstance is seen in cases with a chronic recurrent ulcer, with or without obstruction, whose dietary restrictions have been made more and more rigid, either voluntarily or on advice of a physician. It has been my experience that all such patients will benefit by the addition of 200-300 grams of protolysate® to each day's diet. These patients promptly, and repeatedly, tell me that they feel much, much stronger, as well as obtaining prompt relief from pain and discomfort. The chronically underfed patient also describes a sense of well being, encouragement, and hopefulness after a few days of the increased protein intake. Where surgery remains necessary, the improvement in nutrition and gain in strength make them better risks, and the improved protein metabolism offers better chances for prompt healing and recovery. The same consideration holds for the stomal ulcer following gastro-enterostomy or sub-total resection. I have been encouraged by the number of cases of recurrent peptic ulcers, including those with some obstruction due to the acute activity of the ulcer, and of the recurrent stomal ulcers which have so improved that surgery was avoided merely by adding 200-300 grams per day of protolysate® to the usual Sippy or modified Sippy diets.

In the third group are those patients with an allergy, especially those with a milk sensitivity, who also have a peptic ulcer. Although these cases are not seen very frequently, I have treated six in the past two years. With them I have found the protein hydrolysate invaluable and effective, even when used as the sole source of protein for a period of time. An adequate diet can be supplied such patients by use of the predigested proteins and suitable carbohydrates. The mineral, vitamin and fluid requirements can be met without difficulty.

The last group, and an important one, is composed of the well nourished patient who has a simple ulcer, but whose work requires a large amount of physical activity. The usual Sippy diet, or some modification of it, does provide prompt relief of symptoms, but would fail to provide sufficient protein and calories for the amount of activity required by the patient's job. Unless in a high income bracket, patients cannot take a vacation, or quit the job for three to six weeks. The average patient cannot afford to take time off from his work for this length of time. Many have a large family to support, or there

are other financial considerations which prohibit a vacation, a sick leave, or quitting. The patient must work, and often must work hard. He wears out by noon, or earlier, if he remains on the usual diet prescribed for an acute ulcer. These patients can be kept on the job very easily, and still obtain complete relief of their symptoms merely by adding a protein hydrolysate to their milk. I give them 200 grams of protolysate® in two quarts of milk with an equivalent amount of carbohydrate (in the form of dextri maltose® or dexin®). They can carry this mixture to work with them in quart thermos bottles, drinking it at hourly intervals. With this dietary mixture, they can carry on a full day's work day after day, buffer the gastric acidity throughout the day without taking powders or pills, be free of symptoms, and make rapid progress.

An example of this type of patient is the following case:

A colored section laborer for the Missouri Pacific Railroad entered the hospital with a typical history of peptic ulcer. He was 40 years of age, married, had four children, ranging in age from 6 to 18. He had been seen on two occasions during the previous 18 months, each time with the same symptoms and x-ray demonstration of an ulcer crater in the duodenal cap. Satisfactory response was obtained with each hospital entry by means of the usual Sippy diet and alkalies. It was necessary for him to resume his work without too much delay as he did not have the financial reserves to feed and clothe five other people if he did not work. He had found that when he returned to work he was worn out by noon and could not carry on. Even a lenient boss could not permit him to do nothing for half of each day.

With the last entry the question of surgery was considered so that the patient could return to his job and carry on a full work day. It was an economic necessity. However, he was prevailed upon to take 200 grams each of protein hydrolysate and a carbohydrate in his milk each day. He carried this to work in quart thermos bottles. He was relieved of his symptoms very promptly, felt good, carried on a full day's work, and was not worn out even at the end of the day. He has remained under medical management and has done well for the past two years.

Another case is that of a 55-year-old department store official whom I have seen on many occasions over the past 25 years. He has had several severe massive hemorrhages, and two or three minor ones, and on one occasion he developed a perforation while on a buying trip to New York. An emergency closure of the perforation was done. He has had two massive hemorrhages in the past 8 years, each time while buying in New York. During the war years he was seen at the Mayo Clinic, and gastric resection advised. This was postponed for four months because he could not be away from his store at that particular time. On re-examination he had done so well during the interval, that surgery was indefinitely postponed. He always responded promptly to dietary management with the addition of alkalies and antispasmodics. However, three years previously he had his last hemorrhage, again when in New York, and required several transfusions. On his return home, he once more began his Sippy diet, alkalies and belladonna. Symptoms persisted and he complained of being weak and worn out by 10:00 a.m. He was practically exhausted by this hour each morning. I added 200 grams of protolysate® to his daily milk allotment. He called me at noon on the first day to tell me how much better he felt, that he was not tired and worn out, and that "the stuff tasted awful." He called me again that night to say that even though the protolysate® did not taste too good, he had finished the day feeling quite well, without pain, and full of pep. He volunteered the observation that he felt better with this diet than at any other time when he had been taking milk alone, and that was on many occasions. He became accustomed to the protolysate® by the fifth day and took it well for a period of six weeks. He continues to do well, mainly because for the first time in 29 years he has continued to take care of himself day after day instead of doing as he pleased as soon as he felt good.

These cases, then, and the four groups discussed are my answer to the second question.

Now, to answer the first one: "How do I get the patient to take the hydrolysate?" This is not too difficult a task. It is true that there are a few patients who will not take any hydrolysate. The taste and odor deter them and no persuasion will help. Some honestly try but just cannot do it; some vomit after taking several feedings. In my experience, these cases constitute a very small number. Most patients will take the predigested protein if they are prepared for it by a full explanation of the reasons it is being prescribed, what it does, and just how bad it tastes. Most of them will say that they will try if it will do them some good and remark that they already have taken some pretty bad medicine in their day! I explain to each patient that the hydrolysate does not taste too good at first, but that nearly everyone gets used to it in three to five days; that the taste is mainly that of a strong boullion, and that it is not too bad if taken cold. They are advised to prepare it or have it prepared once a day and put in the ice box to be kept cold. It is better, too, to have someone else prepare the mixture. This avoids the accentuation of the odor which mixing the powder oneself brings out. Most patients will begin to think you believe they cannot do it and resolve to show you they can. Then, you have them!

I, also, tell them what the hydrolysate is, and that the protein supplied is helpful for healing of

the ulcer. Its buffering capacity is discussed and the gain in strength they should experience is emphasized. I have had five patients who have continued taking the hydrolysate for indefinite periods after I had told them to discontinue its use, all saying that they felt so much stronger and peppier even at the end of the day while taking the hydrolysate. It is true that nearly every patient will become accustomed to it in 3-5 days. I have found that the time I take to explain all this to my patients is time well spent with great benefit to them. As one patient has said, "It's the best bad medicine I've taken."

Before closing, I may discuss very briefly the choice of the hydrolysate. We are detailed about the good taste of this or that new one. When it is decided that a hydrolysate is needed, it is used because of its buffering capacity. The protein needs can be met by an intact protein, but the intact proteins are not good buffers. Even milk is not, as many have demonstrated. The better the taste of the hydrolysate the less the percentage of hydrolysis, and one may give the intact protein at much less cost to the patient. Choose the hydrolysate which has the highest percentage of hydrolysis to amino acids. Those with 75 per cent hydrolysis to amino acids and 25 per cent to the polypeptids without any intact protein remaining will be found to be the most effective buffers and are the less expensive ones, too. Most of the products on the market fail to meet the above qualifications and you can be misled if you fail to study the label and ascertain that there is no intact protein present. You choose a hydrolysate because it is hydrolyzed, and the greater the hydrolysis the greater the percentage of amino acids. It is the latter which we want in greatest amount.

In summary, the answer to my second question gives you four groups of patients with peptic ulcer who profit by taking a protein hydrolysate, namely:

(1) Those who have had a massive hemorrhage.

(2) Those who are malnourished.

(3) Those who have an allergic reaction to milk.

(4) Those with a simple ulcer, even though well nourished, but whose work requires greater energy output than is provided by the usual acute ulcer diets.

The answer to the first question emphasized that the time spent in discussing with the patient the reasons for using the hydrolysate, its taste, and what is to be expected of it, is time well spent to the profit of the patient.

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THE CHANGING PATTERN OF HEALTH ORGANIZATION AND ACTIVITIES*

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The achievements of health departments and preventive medicine over a period of the last 75 years have been miraculous. The progress of health departments made in the past has been due to their capacity for change and their ability to meet changes and variations in public health problems. We have witnessed considerable change in the scope of health department activities in the past 25 years, but we have every reason to believe that there will be an even greater change in the pattern of health department programs within the next 25 years.

The increase in the life span, and the reduction in death and disability has been phenomenal in practically all countries of the world. Most of this reduction in death and disability has been achieved by the control of communicable diseases and by elimination and better control of diseases peculiar to the first year of life. In the United States, we have practically eliminated typhoid and smallpox. The complete elimination of malaria transmission in the United States is soon to be expected. In spite of the large number of troops returning from malarious areas during and since World War II, transmission of malaria within the continental United States has been extremely rare.

Although there apparently has been a steady decline in death from tuberculosis for over 100 years, the reduction in the death rate from this disease has been much more rapid within the last few years. With continued vigilance, we can

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reasonably expect tuberculosis to become relatively unimportant as a cause of death within a few years. There has also been a rapid decline of deaths from syphilis. Some of the larger cities with good control programs have almost eliminated congenital syphilis as a cause of death; and as a result of improved treatment, the death rate from the late and untreated syphilitic conditions has steadily declined.

The U. S. Public Health Service, by enforcement of maritime quarantine, has kept invasions of yellow fever, typhus, cholera and plague to a minimum. On the few occasions when these diseases have invaded our shores, the co-ordinated activities of the public health service and local health authorities have kept the outbreaks pretty well contained and limited to comparatively small areas of the country.

Within the last few years, programs for reduction of deaths in mothers and infants have been unusually productive, and we have experienced miraculous declines in infant and maternal death rates. However, it is possible that we will have soon reached the irreducible minimum in infant and maternal death rates. This is particularly true in areas with good health departments and an alert medical profession.

We have been so successful in the control of communicable disease that the complete elimination of all deaths from communicable disease would increase the expectation of life at birth by less than four years. Our success in the control of communicable diseases and infant and maternal death rates has given the United States a lower crude death rate and greater life expectancy at birth than that of any of the large nations of the world. Some of the smaller nations consisting practically altogether of a one-race group, where immigration has been limited largely to the same group, have experienced lower death rates. These smaller countries are: Australia, New Zealand, and Denmark.

However, Dr. Louis I. Dublin of the Metropolitan Life Insurance Company, in a recent paper read before the American Public Health Association, has warned us against smugness because of our present low crude death rates and life expectancy at birth. He pointed out that in age groups above 40, practically all English-speaking nations except Canada, and at least 16 nations of the western world, have lower death rates than the United States. He also called attention to our extremely high accidental death rate at all ages, which compares very unfavorably with that of other progressive nations.

Since the other nations can be expected to catch up with the United States in the control of communicable diseases, unless we do something quickly to lessen the mortality in older age groups and from accidents, we may soon find ourselves with an unfavorable crude death rate when compared with other nations.

The number of our people suffering from mental disease and confined to institutions for the treatment of mental disease is certainly nothing to boast about. The number of cases of psychoneurosis hospitalized by our Armed Forces during the last war and the number of rejections for military service because of mental conditions compared very unfavorably with our allies. The apparently increasing importance of mental disease has led to its designation as the nation's number one public health problem.

We can no longer consider health the mere absence of disease and death, but a state of mental and physical well being where each individual discharges his functions with maximum satisfaction and efficiency. Health departments can no longer be satisfied with programs designed only to prevent disease or postpone death. We must be concerned with increasing the productive span of human life, as well as the length of human life. Health departments are supported for the protection and convenience of the public and their program must be modified or changed to meet the changing needs of the population. The change in age distribution of the population with a greater concentration in the older age groups, with an increase in death from degenerative diseases, accidents and ever increasing importance of mental disease, combined with the continual decline in communicable diseases, infant and maternal mortality can be expected to result in more emphasis on mental health. Health department programs to reduce the ravages of the degenerative diseases, accidents and disabilities resulting therefrom can be expected.

Public health departments have played an important part in bringing about the comparatively high standards of health we now enjoy. These health departments have been composed of a team of specialists, including public health physicians, nurses, public health engineers, veterinarians, bacteriologists, chemists, public health educators and others. In the future, the public health departments can be expected to employ an ever increasing number of medical and non-medical specialists. Health departments can be expected to utilize more public health psychiatrists, psychologists and psychiatric social

workers in mental hygiene programs to improve the effectiveness of their own staffs, and to improve the quality of services to the public. It is expected that the services of the public health psychiatrist and his associated staff will be available and utilized by schools and nonofficial health and welfare agencies in the community.

With the increasing importance of diseases of old age such as heart disease, cancer, diabetes, and arteriosclerosis, health departments can be expected to employ physicians trained in public health and in chronic diseases. The health department can be expected to employ more dentists and dental technicians. The public health nutritionists will be used more extensively, and it is possible that specialists in rehabilitation and physiotherapists may assume an important role in health departments.

After these general remarks, let us for a moment visualize a public health program of the future and some of its personnel requirements.

We will maintain our well baby conferences and maternal hygiene clinics, and our communicable disease control activities, although the personnel necessary to an adequate communicable disease control program may be reduced. A decline in the acute infectious diseases and a further decline in tuberculosis and syphilis should make possible some early reduction in personnel and facilities for the control of communicable diseases.

Due to the increasing importance of insects in the spread of communicable disease, health departments will employ more entomologists and because of the increasing relative importance of diseases transmissible from domestic animals to man, we will utilize the services of veterinarians more in the future. Quarantine procedures will be reserved more for special and emergency situations and become far less routine.

The services of the public health engineer will be employed in a greatly expanded public health field. This will include not only pasteurization plants, water purification and sewage disposal, but will include consultation on the problems of housing, lighting, air conditioning, ventilation, industrial hygiene and others.

Sanitarians will be better trained and we will develop assistant sanitarians to perform many of the duties now performed by public health inspectors. Some of the present duties of public health inspectors may be abandoned as useless or unproductive from a public health standpoint. By employing the services of entomologists and veterinarians, our present environmental sanitation control measures may be expected to become more scientific and more effective.

The expected expansion of public health activities will necessitate more training for public health nurses and some of the work now being performed by public health nurses may be taken over by other specialists in the field of public health, such as medical social workers, nutritionists, psychiatric social workers and others.

In the future, the public health statistician will serve all divisions of the health department as well as the public. All public health workers will be better trained in the application of statistics to public health problems. The health department statisticians will no longer concern themselves with the recording of births and deaths alone.

The importance of the public health laboratory is expected to increase and the number of tests performed by the laboratory as a part of the public health program can also be expected to increase.

The public health educator will be depended upon more and more for the dissemination of mass media and for in-service training programs for the personnel of health departments.

The anticipated expansion of health departments will lead to the training and utilization of more administrators and business managers in public health.

I have intentionally left until the last a discussion of the new medical specialists which will be necessary to future public health programs. One of the most important is the mental hygienist and public health psychiatrists, who is already being added to many state health departments and some of the larger local health departments. His services will not only include the conduction of mental hygiene clinics, but will be utilized for orientation of public health department staff members and the staffs of other official and unofficial agencies. Due to the increasing importance of the degenerative diseases and with the development of new tests for the early detection of diseases such as diabetes, cancer, heart disease, and anemia, we can expect the organization by health departments of multiphasic testing clinics for the early detection of the chronic diseases and their subsequent referral to physicians for final diagnosis and the treatment indicated.

It is important that the medical profession maintain leadership in the promotion of these activities, for no other public health profession is qualified by training or experience to provide the necessary know-how in the prosecution or interpretation of these surveys. The opposition of some physicians to mass surveys for chronic disease detection is unwarranted. If the tests are inadequate, every effort should be made to improve the tests or testing technics. If the mass detection surveys are not being conducted properly, the professions should consult with and advise the health officer upon methods for improvement. We have completely sold the public upon the benefits of early detection and treatment of disease. Its application in the control of tuberculosis and syphilis has been well established. The public cannot understand the opposition of the profession to programs for the early detection and ultimate treatment of chronic disease, after such surveys have already been very beneficial in reducing disability and deaths from such diseases as tuberculosis and syphilis. The public will not be satisfied until the mass testing technics for detection of chronic disease have been tried.

Since a large number of the degenerative diseases are associated with overweight and underweight, nutrition classes will be employed more and more in public health centers. We have not the available medical manpower to provide such courses of instruction in the doctor's office and it would probably be a poor utilization of medical manpower if we did.

The Veteran's Administration and some insurance companies are demonstrating the immense benefits to be derived from programs for rehabilitation of victims of degenerative diseases and accidents. A public demand for such a program can be expected in the future. It is possible that after thorough study and some experimentation, it may be decided that the public health department is the best agency to administer such a program. This should be decided after a thorough study, with the most interested members of the medical profession taking the lead.

It is to the best interest of the medical profession and public health departments that physicians maintain their present leadership in the field of public health. This can best be done by supporting public health programs, and advising and consulting with health officials.

Public health physicians have been recognized as specialists by the American Medical Association and the public in general. Health officers need the advice and help of other specialists and members of the medical profession. Constant liaison and consultation between the health officer and other members of the profession will result in mutual benefit. But a failure to advise and consult with each other can result in undesirable consequences to both the medical professions and health departments.

It is most important that the medical profession maintain its leadership in public health by promotion of adequate health programs for the protection of all the people in the community. It must give due consideration to other specialists on the public health team, and should not attempt to dictate the entire program. The public health department constitutes the most effective bulwark against public criticism of the medical profession and dissatisfaction with the type of health and medical care the public is receiving. This criticism and dissatisfaction which may arise in the absence of an adequate health program, may lead to the application of unwise methods of correction which could lead to a failure in gaining the desired public health objectives and could result in much damage to the free practice of medicine which we now enjoy and cherish.

LARYNGECTOMIES IN REVIEW*

TWENTY YEARS' EXPERIENCE

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From time to time it seems desirable to review our experience in the treatment of various diseases, for only in this way can we accurately evaluate the methods of treatment we are employing and thus assure our patients of the best available medical care. It was with this purpose in mind that we reviewed our experience in the treatment of patients with carcinoma of the larynx during the past twenty years. During this

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time 537 patients with this disease were seen in our private practice. This study was limited entirely to patients seen in private practice because of the accuracy of these records and follow-up examinations. Of the entire series 172 patients, or 32 per cent, had such extensive lesions when first seen that they were considered inoperable. That approximately one-third of the entire series had inoperable lesions when first seen, and this in a comparatively intelligent group of patients, should make us renew our efforts to educate both the general medical profession and the public regarding the significance of the early symptoms of laryngeal cancer if we expect to reduce the incidence of inoperable lesions. Irradiation, which was advised in all these cases, helped to prolong the lives of those who accepted such treatment, but we cannot help thinking that if these patients could have been seen earlier, some of them might be alive today. In 194 patients the lesions were small enough for intralaryngeal extirpation of laryngofissure. In the remaining 171 patients, or 31.7 per cent of the entire series, the lesion was so far advanced that laryngectomy was necessary. This presentation will be confined to a discussion of this latter group of cases.

INCIDENCE ACCORDING TO AGE, SEX AND COLOR

The majority of patients with carcinoma of the larynx are middle-aged men. Only 8 per cent of the 537 patients with carcinoma of the larynx were females. This is only slightly lower than the incidence of 10 to 15 per cent, usually reported by most authors. Only 7 of the 171 patients who had laryngectomies were women.

The average age of the patients having a laryngectomy was 56.6 years. The youngest patient was 20 years old and the oldest 80 years. That age is not a contraindication to laryngectomy is evidenced by the fact that the 80-year-old patient in our series not only survived the laryngectomy but had a more uneventful postoperative convalescence than many others years younger.

There were several Negro men in this series but we personally do not recall ever having seen a Negro woman with carcinoma of the larynx, although occasionally one reportedly is seen in charity clinics.

SYMPTOMATOLOGY

The task of performing a laryngectomy invariably stimulates the provoking thought that had the diagnosis been made earlier there would be no necessity for such a formidable surgical procedure. Progress has been made in establishing in the public's mind the fact that persistent hoarseness frequently indicates cancer of the larynx. There are still, however, patients who come to see us with a history of hoarseness of long duration, who were reluctant to seek medical aid because they felt no pain. Thus, the average duration of hoarseness in our series was 7.6 months and 14 or 2.6 per cent of the 537 patients with carcinoma of the larynx were physicians, who certainly should have realized the significance of hoarseness. It is regrettable that early intrinsic cancer of the larynx produces no pain. If pain occurred in the early stages of the disease, we should see these patients before such a radical procedure as laryngectomy became necessary. Laryngologists have been successful in making the public realize the significance of persistent hoarseness but we have not stressed with sufficient force the fact that early intrinsic cancer of the larynx produces no pain or discomfort of any kind. Until the public is made to realize this, many will probably ignore the warning of persistent hoarseness until the lesion has advanced so far that only laryngectomy or extensive radiation can be offered them.

In the advanced cases, of course, pain does occur. However, often this will be manifested as pain referred to the ear on the side of involvement rather than in the throat. Unfortunately, many of these patients are treated for neuralgias at the stage when the lesion is a borderline one for surgical therapy. Coughing, at times bloody expectoration, and difficulty in breathing are late manifestations of extension of the disease beyond the larynx and metastasis.

DIAGNOSIS

Mirror laryngoscopy remains the easiest method of examining the larynx and should be adequate for clinical diagnosis. It cannot be stressed too strongly that this should be a routine office examination. For example, early laryngeal carcinoma, which was producing no symptoms since the lesion was on the upper surface of the cord, was detected by this means in 2 of the 537

patients in this series. In many cases direct laryngoscopy is necessary to determine accurately the extent of the lesion. Although mirror laryngoscopy permits a clinical diagnosis with a great degree of accuracy, laryngectomy should never be performed until some tissue from the lesion has been examined microscopically. Palpation of the larynx and cervical region is productive of much information. Deep palpation in the region of the bifurcation of the carotid may reveal metastatic nodes at an early date. Soft roentgenograms of the larynx have not been helpful except to confirm the fact that the lesion is extensive.

We have found suspension laryngoscopy to be the best means of directly studying the larynx preoperatively and at the time of biopsy. This method permits visualization of the entire larynx as well as the mouth of the esophagus, and thus provides information necessary to select the procedure best suited to the individual case.

INDICATIONS

Laryngectomy should be performed only on patients who are in good or fair physical condition. Thus, a thorough physical examination is a preoperative requisite. The importance of eliminating cardiorenal, diabetic and metastatic complications cannot be too strongly emphasized.

The location, extent and degree of malignancy will largely determine whether or not a laryngectomy should be performed. Intrinsic carcinomas of grade I or II limited to a portion of one vocal cord will usually respond favorably to a laryngofissure operation. More advanced intrinsic lesions of such size as to make a laryngofissure operation questionable require laryngectomy. Fixation of one vocal cord or arytenoid indicating invasion and infiltration by the malignant process is a definite indication for laryngectomy. Posterior extension of the lesion with arytenoid involvement predicates esophageal participation because of the abundant lymphatic network in this area. Early marginal lesions of the epiglottis are seen infrequently, because as a rule they do not produce symptoms in the early stages and when discomfort develops they are far advanced. Thorough surgical extirpation of these early growths when seen will usually result in a complete cure. Carcinomas involving the base of the epiglottis may be deceptive, for they frequently infiltrate deeply and may extend by way of the lymphatics into the preepiglottic space. Laryngectomy with removal of the hyoid bone and preepiglottic space gives best results in these types of cases. Subglottic lesions likewise do not produce early symptoms until the vocal cords become involved. Such carcinomas are best eradicated by complete removal of the larynx. Mild extrinsic lesions involving the aryepiglottic folds, the base of the epiglottis or the arytenoids will with surprising frequency respond successfully to laryngectomy.

If strict adherence to the indications for laryngectomy were observed, the percentage of cures following this operation would be much higher. In the last few years we have accepted for laryngectomy fairly advanced cases of extrinsic carcinoma which formerly were considered inoperable. Although the rate of recurrence in these cases is high, the salvage is sufficient to justify performance of such a radical operation. Postcricoid carcinomas are seldom diagnosed early, as symptoms appear relatively late, and consequently the prognosis in such cases is grave. In spite of this two patients with postcricoid carcinoma seen in the early stages of the disease lived more than five years following laryngectomy.

TECHNIC

The fundamental principles of surgery govern whatever technic is used in the performance of a laryngectomy. Sedation and a local anesthetic have been employed in the majority of cases in this series. If the patient becomes restless during the operative procedure, a general anesthetic is administered, preferably as soon as the trachea has been severed.

In our early experience laryngectomies were performed through a cross T incision followed by complete dissection of the larynx. At no time was the hyoid bone severed or removed and following the operation numerous rubber tube drains were inserted into the wound. Esophageal fistulas were frequent and always prolonged hospitalization. Since 1931 we have used the straight line incision extending from above the hyoid bone to the suprasternal notch. Many years later this approach was popularized as the narrow-field technic. This incision has served excellently in the performance of laryngectomies and is extended only when complications occur. The incision is carried down to the thyroid cartilage, the cricoid cartilage and the upper three rings of the trachea so that when the strap muscles

are dissected free on each side, the entire larynx is skeletonized. The hyoid bone is split in the median line to permit wider exposure of the larynx. If there is any indication of involvement of the preepiglottic space, the technic is altered so as to remove the hyoid bone together with the preepiglottic space. A Gelpi retractor provides the best exposure and all vessels are ligated.

The thyroid gland is divided in the median line and dissected free from its attachments to the surface of the trachea. The trachea is partially divided just below the cricoid cartilage and the tracheal mucosa on both sides of the incision is injected with procaine to help control hemostasis while every effort is made to prevent blood from flowing down into the trachea. A small flap or tongue is fashioned on the posterior wall of the trachea, provided there is no subglottic extension. The trachea is then completely severed and an accurately fitting rubber tube is inserted into the trachea and held in place by safety pins. This tube is controlled by the anesthetist, who sits at the head of the table. Dissection of the larynx is continued from above and below, and when the posterior portion of the larynx is completely free, just prior to opening of the hypopharynx, the anesthetist uses a suction tube through the mouth to aspirate retained secretions so that they will not spill into the wound.

The hypopharynx is exposed by means of an incision in the mucosa in the interarytenoid region, depending, of course, upon the extent of the malignancy. As soon as the mucosa is incised, a piece of yard gauze soaked in merthiolate® solution is introduced into the hypopharynx. If the epiglottis is not involved, traction is made on the larynx and the mucosa on the lingual surface of the epiglottis is gradually dissected free. This exposes both superior laryngeal vessels, which must be ligated. Careful dissection will permit incision of the mucosa on the edge of the epiglottis; in this way much mucosa is preserved and only a small opening is created in the hypopharynx, so that adequate tissue is left for repairing the defect. When removed, the larynx is immediately split open posteriorly and examined carefully to be sure that all the malignancy has been extirpated. Meticulous care is given to closure of the hypopharyngeal opening. Interrupted atraumatic sutures are used to approximate the delicate mucosa. This is reinforced by a second and third layer of sutures which approximate the edges of the constrictor muscles. We believe that attention to this phase of the operation is largely responsible for the development of fistulas in only a very few of our patients. The edges of the hyoid bone are approximated with heavy sutures. A small curved cutaneous flap is dissected free on either side of the trachea. Numerous sutures anchor the trachea to the cutaneous margins and the tracheal flap previously referred to is then utilized to create an adequate tracheal stoma.

A small dermal drain is inserted through the incision into the lateral angles on each side. The wound is closed tightly, a number 8 laryngectomy tube is placed in the tracheal opening and an ace bandage maintains pressure on the entire neck for the first seventy-two hours. This bandage is reapplied when the wound is dressed.

Block dissection of the cervical lymph nodes is not done routinely. In advanced extrinsic carcinoma and in those patients with glandular enlargement but in whom the nodes are not too large or too extensive, radical neck dissection is performed.

In a number of patients because of dyspnea emergency tracheotomy was necessary. When such a procedure becomes necessary and it is realized that laryngectomy is inevitable, the tracheotomy is performed preferably through the cricothyroid membrane, sacrificing, if necessary, a portion of the cricoid cartilage. This procedure preserves the continuity of the tracheal rings, thereby assuring a good firm tracheal stoma.

Postoperative Care.—Nourishment is given through a nasal feeding tube and adequate antibiotics are administered. The feeding tube is removed on the fifth or sixth postoperative day. The average patient is ready to leave the hospital on the seventh day, when he reports to the office for further instruction in the care of the tube and the development of speech.

RESULTS

Although laryngectomy is an extremely radical and disabling operation, in indicated cases it is a life-saving procedure, and our patients are all grateful for added years and freedom from cancer. Laryngectomized patients readjust rather nicely to their new mode of life. The majority, under proper guidance, quickly learn the fundamentals of an esophageal voice, and development of such speech is limited only by their initiative. Surprisingly good voices are developed by many of them. One of our patients is now assistant

professor of speech in a large university and lectures regularly to medical students. The few who fail to develop esophageal speech may successfully use an electrolarynx. These patients, from all walks of life, are as a rule a happy lot, eager and able to resume their position in the economic and social world and ever grateful for their freedom from malignancy.

In spite of the fact that a number of our patients were not only advanced in age but also gave a history of cardiovascular disorders, there were no operative deaths in the present series. This is probably in part due to careful preoperative medical investigation of the patient and close cooperation with the internist.

Of the 171 patients in the present series 70.3 per cent survived five or more years; 5 patients lived eight years, 6 nine years, 3 ten years, 1 eighteen years and 2 twenty years. It is, of course, extremely difficult to evaluate results of treatment of cancer anywhere in the body because the prognosis depends upon a number of factors. Perhaps the most important of these are the extent of the lesion and the grade of the malignancy. Obviously, the higher grades have a poorer prognosis, even with the best available treatment, than in the lower grades. As would be expected, in the present series, the majority of our recurrences were in patients with grade III carcinoma. Thus, 60 per cent of the 29.7 per cent of recurrences in the 171 patients were in those with grade III carcinomas and 30.8 per cent in those with grade II carcinomas. An enlarged cervical lymph node is usually the first indication of a recurrence. In such cases block dissection of the neck, performed promptly and followed by roentgen therapy, may help to prolong life but, of course, in all such cases the prognosis is poor. Recurrences are inevitable in a certain number of cases and a second operation is not always successful but it can occasionally provide some degree of comfort in the remaining months of life.

SUMMARY

Of 537 patients with carcinoma of the larynx encountered in our private practice during the past twenty years, 171, or 31.7 per cent, had such extensive lesions that laryngectomy was necessary. Of this latter group, 70.3 per cent survived five or more years and 2 patients lived twenty years postoperatively. Of the 171 patients, 29.7 per cent had recurrences, of whom over two-thirds had grade III carcinoma.

DEXTROCARDIA SECONDARY TO FOREIGN BODY IN LEFT BRONCHUS*

REPORT OF TWO CASES

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When a bronchus is completely obstructed by tumor, blood clot, mucus, or by foreign body with accompanying inflammatory reaction, the air distal to the obstruction will rapidly be absorbed with resultant atelectasis. If a large part of the lung collapses in this way, the mediastinum shifts towards the obstruction. This phenomenon has long been recognized and it may often be diagnosed by physical examination only.

It is, however, not so generally appreciated that when a foreign body in the bronchus produces only incomplete obstruction, this obstruction may allow air to go beyond it but not to return. Such valve-like action results in overdistention of the lung distal to the foreign body, and when this emphysema becomes marked there will be a shift of the mediastinum away from the obstruction. If the foreign body is not radiopaque, the roentgenogram may appear puzzling; this is especially true if the foreign body is in the left bronchus. It is only too well known that an object dropped into the trachea of a person in the upright position will drop straight down into the large right bronchus. It must be remembered though that violent coughing may expel the foreign body from the right bronchus and then it may enter the smaller left bronchus from which it is not easily dislodged.

CASE REPORTS

Case 1.—A little boy, 15 months old, had been becoming increasingly dyspneic for more than a month. When he was brought to the Ponce de Leon Infirmary on January 26, 1951, his mother said that this trouble had started suddenly with a severe paroxysm of coughing when he was eating pork unobserved. She guessed that he had aspired a piece of bone.

The child was in rather serious condition. Respiration was labored and cyanosis was evident. The left chest

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was hyperresonant and the mediastinum was shifted to the right. The x-ray of chest (*Fig. 1*) revealed marked emphysema of the left lung with depression of that leaf of the diaphragm and a shift of the mediastinum to the right. The right lung was somewhat compressed.

Especially in view of the history of sudden onset, the diagnosis of foreign body in the left main bronchus was made.

Under ether anesthesia a 3 mm. bronchoscope was passed. The orifice of the left bronchus was choked with purulent exudate and granulation tissue. The exudate was aspirated. In pinching off the granulation tissue something hard was encountered. When the bronchus had been cleaned out and the bleeding stopped with epinephrine, a firm white object was seen. This was grasped with forceps and removed. It proved to be a piece of bone measuring 7 by 14 mm.

By the time the bronchoscope was out, a dramatic change had taken place in the baby's condition. His respiratory difficulties cleared up promptly and in a few minutes his color was good. He was kept in an oxygen tent for eight hours as a precautionary measure, and penicillin and streptomycin were administered twice a day. He went home well on the fourth day.

Case 2.—A woman in south Georgia, hearing of the first case, saw a striking resemblance in it to that of her own 14-months-old son. Christmas day he had experienced an episode of choking, followed by wheezing and fever. An x-ray of the chest had revealed a shift of the heart to the right. The baby had continued to wheeze with frequent bouts of fever. She brought him to the infirmary on March 5.

On admission he was breathing hard, wheezing with every breath. Hyperresonance was noted all over the left chest. While the baby was asleep breath sounds were suppressed on the left, but they came through well when he was screaming. The x-ray (*Fig. 2*) confirmed the emphysema of the left lung and the shift of the mediastinum to the right.

Again the diagnosis of a foreign body in the left main stem bronchus was made.

This child did not appear so critically ill as the first one. It was, therefore, decided to try for 2 days to get his fever down with antibiotics before operating.

The 3 mm. bronchoscope revealed the lining of the trachea diffusely inflammed, with cloudy fluid exuding from the left bronchus. After aspirating this, a sandspur was seen wedged in the bronchus. This was removed with forceps.

This child did not get along quite so well as the first one. It was necessary to keep him in an oxygen tent for 20 hours. After that, in spite of penicillin and streptomycin, for several days he ran a fever every afternoon, once going to 103° (rectal). No explanation of the fever was found. At the end of a week, however, he was in excellent condition.

FIG. 1

Partial obstruction of the left bronchus by a piece of bone has caused great over-distention of the left lung and depression of the left diaphragm. This has pushed the mediastinum to the right and compressed the right lung (*Case 1*).

FIG. 2

Partial obstruction by a sandspur impacted in the left lung has caused emphysema of the left lung with a shift of the mediastinum to the right, compressing the right lung (*Case 2*).

DISCUSSION

While the diagnosis of a ball-valve obstruction may be inferred from the history and physical condition, and can be made pretty definitely from a roentgenogram revealing emphysema on the affected side, if there is any question as to the diagnosis it is advisable to have plates made on both inspiration and expiration. On inspiration the leaf of the diaphragm on the unobstructed side will be lowered and the mediastinal contents will bend to shift to the midline. On expiration, however, the bronchial walls around the obstruction will collapse and prevent the expulsion of air distal to the foreign body; consequently, while the leaf of the diaphragm on the unobstructed side has ascended, the leaf on the side of the obstruction remains where it was, and the mediastinum shifts towards the unaffected side. At the same time, it must be remembered that when the obstruction has resulted in extreme emphysema, these signs may be less pronounced; it must also be remembered that if the foreign body is in a smaller bronchiole, only the lobe or lobule distal to the obstruction will be dilated.

SUMMARY

Two cases are reported in which a translucent foreign body in the left bronchus had permitted air freely to enter that lung, but interfered with the air which was leaving the lung. The resultant emphysema had caused a shift of the mediastinum to the right. This shift had been verified by x-ray one month and three months, respectively, before definitive treatment was attempted.

The bronchoscopic removal of the foreign bodies, a piece of bone and a sandspur, was followed by prompt recovery in each case.

CONGENITAL DYSPLASIA OF THE HIP JOINT IN EARLY INFANCY*

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The literature of this subject is voluminous. However, practically all the published articles are of an orthopedic nature and appear in orthopedic and surgical journals. In a recent and complete treatise by Kreuz and Shands[1] on congenital dislocation of the hip, eighty-one different articles are listed in the bibliography and only six of these appeared in journals that are likely to be read by the physicians that care for infants and children. It is felt that standard textbooks of pediatrics, as well as most medical school and resident teaching fail to stress adequately the important findings leading to an early diagnosis of this crippling disorder. The fact that the orthopedist still does not see the majority of these cases until after the age of walking is further evidence to support the view that this subject has not been adequately emphasized to the pediatrician and family physician. Certainly the physician who cares for the patient during early infancy is the key man in the proper handling of this anomaly.

The purpose of this writing is to stress the important findings leading to an early diagnosis and to make physicians who care for infants more cognizant of this condition as it appears before the age of walking. During a three-year period (January 1948 to January 1951), the author saw six infants with congenital dysplasia of the hip. The observation of this comparatively large number of cases in a small pediatric outpatient service has prompted this writing.

IMPORTANCE OF EARLY DIAGNOSIS

Chandler[2] points out that the diagnosis of congenital dislocation of the hip, unfortunately, rarely is made before walking; most cases coming to the orthopedic surgeon because of delay in walking plus a limp. As quoted from an article by Howorth,[3]

> "Congenital dislocations of the hip should be reduced as soon as possible after they are recognized, as early results are more favorable in proportion to the early age of the patient."

Kreuz and Shands[1] in their excellent treatise say that in the first few months of life the displacement is so minimal that it suffices to place the normally flexed infant's thigh in slight abduction to obtain reduction. Apparently, there is general agreement that the cardinal factor in the prevention of crippling from this disorder is early diagnosis followed by early treatment.

Let us not be confused by terminology. Congenital dysplasia of the hip refers to a delayed and inhibited ossification of the cartilaginous structures which enter into the formation of the hip joint, namely: the innominate bone and femur. This dysplasia results in an inadequate and deformable joint socket. Primary dysplasia may be complicated by dislocation of the hip

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*From Children's Clinic, Biloxi, Mississippi.

(luxation), or by subluxation of the hip. When the femoral head is completely displaced from the acetabulum there is luxation; when partially displaced, subluxation; and when there is no displacement, presubluxation. Obviously, the most important factor leading to the sequelae of dysplasia is weight-bearing. The majority of the cases of congenital dysplasia of the hip are not recognized nor treated until after walking and in the cases where the sequelae have not occurred and the diagnosis is less obvious, symptoms may not appear until later in adult life. No doubt, many cases diagnosed as osteoarthritis, degenerative hip disease, infection, Legg-Perthe's disease and malum coxae senilis actually represent late sequelae of congenital dysplasia of the hip.

As the late Vernon L. Hart[4] put it,

"No other chapter of medicine presents greater possibilities in preventive pediatric-orthopedic medicine than congenital dislocation of the hip."

EARLY RECOGNITION

Theoretically, our aim should be to recognize this anomaly at the first examination of the infant. In cases five and six, it was diagnosed at ages six and eight hours respectively (*Figs. 6* and *7*). If the physician is cognizant of the important signs, many of these cases will be recognized during the initial examination of the infant.

Under the age of six months one rarely sees the hip dislocated. Therefore, the signs that are seen on physical examination are those caused by an improperly formed joint socket. So, as we consider this anomaly in early infancy, we cannot expect to see such dramatic findings as an obviously elevated trochanter and a lateral prominence of the head of the femur on the affected side.

The history is of very little importance. During the latter portion of the first year one may get the chief complaint of a delay in pulling up or a delay in toddling with support. Occasionally the mother will have noticed less movement of the lower extremity of the affected side. However, one usually finds this condition in early infancy by routine examination and without a history prompting a search for it.

The close relationship between congenital hip dysplasia and congenital clubfoot is both interesting and important. Kreuz and Shands[1] refer to an article by Bomfin where it is reported that of 364 cases with a primary diagnosis of dysplasia of the hip, 55 per cent had associated clubfoot, and of clubfoot, 39 per cent had associated hip dysplasias. This evidence should certainly prompt one to obtain a routine hip x-ray on every case of clubfoot.

In contrast to the history, physical examination is most important in early recognition of congenital dislocation of the hip. It is felt that no case of congenital dislocation of the hip will pass into the walking stage unrecognized if the physician does a thorough examination of the lower extremities during each well-baby examination. Now let us consider the dysplastic hip in a small infant (*Fig. 1*).

Relative immobilization of the hip may often be the only sign found in an early case. The adductors are found to be spastic and abduction with the hip flexed will be limited on the affected side. The normal range is 75 to 90 degrees from

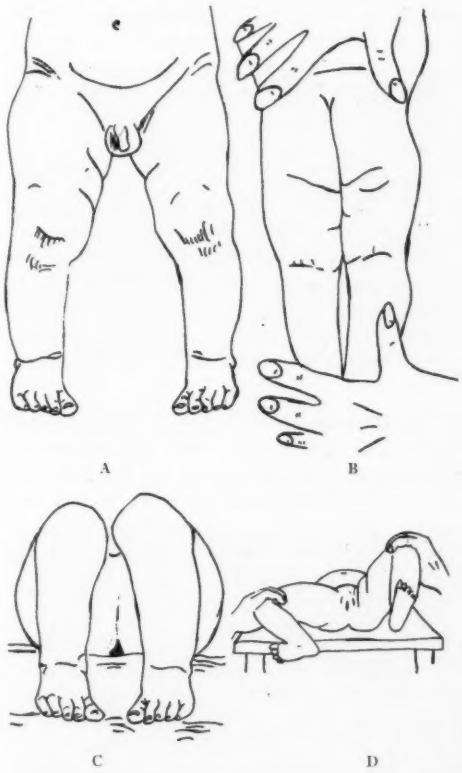

FIG. 1

Sketches of infant to illustrate physical findings. A and B, after Kreuz and Shands[1], show asymmetry of skin folds which are suggestive of right congenital hip dysplasia. C, after Kreuz and Shands[1], shows the most satisfactory method of demonstrating shortening. Note the right knee is lower than the left. D, after Hart,[4] demonstrates limited abduction of the left hip. (Reproduced by permission of authors and publishers).

the perpendicular and in congenital dysplasia of the hip the range is 45 degrees or less. The thigh may be held in a state of flexion and resistance is met on attempted extension. The affected side may be relatively motionless. The rotational attitude of the extremity is variable and is not an important sign.

The presence of asymmetrical skin creases of the thigh is the most obvious of all findings and is the finding that most often leads one to investigate the patient more thoroughly for dysplasia. The dysplasia of the acetabulum makes for an unsteady hip joint and the surrounding muscles respond in an effort to effect increased stability by becoming spastic. These spastic muscles tend to produce more deeply furrowed folds and also increase the number of skin folds by their upward pull. Although this finding is obvious, it is also the most unreliable of all signs; it occurs in normal infants (particularly in obese babies) and its absence has no importance. In addition, there is less apt to be an asymmetry if the dislocation is bilateral (35 to 40 per cent are bilateral).

The presence of a higher gluteal fold on the affected side is a more reliable sign than asymmetrical skin creases of the thigh but again is not diagnostic. This finding is often present in the very young infant with this condition. In addition, there is usually an elevation of the popliteal fold on the affected side. Measured shortening is very reliable if it is present; however, in infants who have not walked this may be absent.

The difference in leg length is often difficult to determine in early life. The best method of demonstrating shortening is to lay the infant on its back, flex the hip and knees moderately and place the feet parallel and together on the table. Shortening will be revealed by the difference in knee levels, the affected side being lower (*Fig. 1C*).

An extremely valuable finding is the jerk or click sign originally described by Ortolani.[4] The thighs are flexed 90 degrees and are gradually abducted. If there is displacement of the head of the femur or a tendency toward luxation, there will result a palpable and at times audible jerk or click as the head meets the acetabular surface. This sign is not a constant finding in dysplasia of the hip, but when it is present one can be absolutely sure of the diagnosis. The sign is pathognomonic of dysplasia of the hip. The jerk sign was demonstrable in cases five and six during the first twenty-four hours of life. This sign should not be repeatedly demonstrated as the delicate cartilaginous femoral head could possibly be damaged by this unwarranted trauma.

Another often described sign is the so-called telescoping sign. To carry out this maneuver one grasps the extended lower extremity and pushes it superiorly, attempting to slide the head of the femur upward. If the slipping of the head upward is accomplished, then telescoping is said to be present. In the six cases presented, this sign could not be demonstrated satisfactorily. In the hands of the author this was an unimportant sign.

When the physician sees a sign or signs remotely suggesting congenital dislocation of the hip, he should order x-rays without delay, and be qualified to pass judgment on the films. The x-ray findings have not been brought adequately to the attention of the physicians who care for infants. The greatest difficulty encountered in the interpretation of the x-rays is that of proper positioning of the infant. It is granted that it is impossible to obtain constant and desired positioning in small infants, but every effort should be made to have the infant in a true supine position with the legs together and the feet parallel and pointing upward. The important x-ray findings are shown and discussed in *Figs. 2* to *7*.

The most important and most reliable early roentgenographic finding in congenital dysplasia of the hip is the deficiency of the upper margin of the acetabulum. In evaluating the acetabula of questionable cases, it becomes apparent that

FIG. 2, CASE 1

T. J., a white male 21 months, was brought in by his mother because of a right-sided limp. Note the increased acetabular index on the right, the broken obturator-coxofemoral curve and the smaller and less dense right capital epiphysis. Bruce's measurements demonstrate a complete dislocation. This illustrates well the effect of weight bearing on a dysplastic hip.

a method more accurate than observation of the roentgenogram is needed. Bost *et alii*[5] have cited the measurements of Hilgenreiner which present a method that can be used in the interpretation of the roentgenogram. Of Hilgenreiner's measurements, the portion in which we are interested is the acetabular index. In this measurement, a transverse line is drawn between the lowest tips of the ilia at the region of the triradiate cartilage. Then a line is drawn from the tip of the ilium to the upper and outer portion of the acetabulum. The angle formed by these two lines is designated as the "acetabular index"[6]. Not only is this index of value in diagnosis, but it also may be used in following the progress of a patient during treatment. The acetabular index has been recorded in *Figs. 2* to *7*.

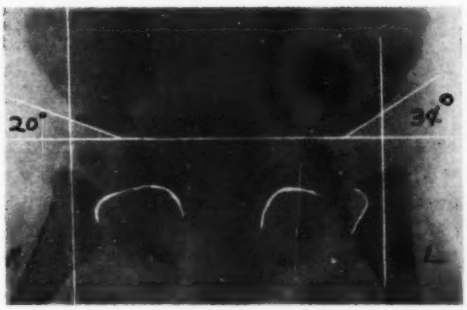

FIG. 3, CASE 2

B. B., a white female 9 months, was referred with the diagnosis of rickets, but instead the patient was found to have the clinical signs of congenital dysplasia of the left hip. The x-ray shows a broken obturator-coxofemoral curve, an increased acetabular index, and a smaller and less dense capital epiphysis on the left. Bruce's measurements suggest a subluxation. This figure also illustrates poor position of patient when x-ray was taken.

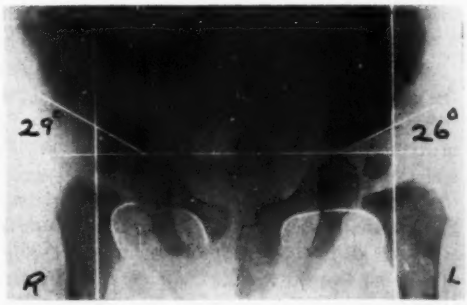

FIG. 4, CASE 3

P. F., a white female 5½ months, was seen during a well-baby examination and clinical signs of congenital dysplasia of the right hip were observed. This x-ray presents a picture of questionable diagnostic signs. There is not a great difference in the acetabular indices or the capital epiphyses. The obturator-coxofemoral curve is definitely disrupted on the right. The consulting orthopedist agreed that the right hip was dysplastic and the infant was treated. Perhaps the infant's course would have been uneventful without treatment but the gamble is too great.

Kleinberg and Lieberman[6] report measurements of the "normal" acetabula in ten patients under one year of age with unilateral dislocation

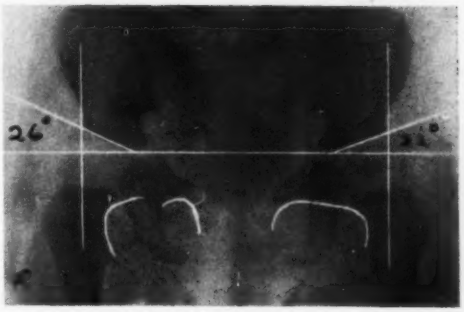

FIG. 5, CASE 4

V. R., a white female 6 months, was seen during a well-baby examination. The physical findings were suggestive of congenital dysplasia of the right hip. The x-ray reveals a broken obturator-coxofemoral curve and no capital epiphysis on the right side. The acetabular index is greater on the right but is less than 30 degrees. Many would doubt the diagnosis on this case, but again orthopedic treatment was instituted.

FIG. 6A, CASE 5

S. S., a white female, was seen first at age 6 hours and was found to have the jerk sign of Ortolani on the right side. The x-ray at that time revealed high acetabular indices bilaterally and it was felt there was a definite dysplasia on the right and probably on the left. The consulting orthopedist was not sure of the diagnosis but a Frejka pillow splint was recommended. The splint was used only occasionally by the mother.

FIG. 6B, CASE 5

S. S. (same patient as *Fig. 6A*) was seen again at 8 months and the x-ray at that age was convincing. The right hip is definitely subluxated and the left side appears in good condition.

FIG. 7A, CASE 6

C. S., a white female, was seen at age 8 hours. There was an asymmetry of the femoral skin creases and the gluteal fold was elevated on the left side. The jerk sign of Ortolani was present. The initial x-ray shows an increase acetabular index and a broken obturator-coxofemoral curve on the left side. The acetabular angle is also fairly large on the right side.

FIG. 7B, CASE 6

C. S. (same patient as *Fig. 7A*) at age 5 months. The x-ray findings at this age are unequivocal.

as follows: high 27.5°, low 15°, average 23.6°. It was decided that it would be of value to determine the acetabular index of a larger group of normal infants under one year. Therefore, hip x-rays were taken of 38 females and 39 males, all of whom were under one year of age. These infants ranged from 1 month to 12 months of age and had no clinical evidence of congenital dysplasia of the hip. The results are given in *Table 1.*

MEASUREMENTS OF THE ACETABULAR INDEX OF 39 MALES AND 38 FEMALES UNDER THE AGE OF ONE YEAR

	(High Degrees)	(Low Degrees)	(Av. Degrees)
Males, right hip (39)	29.0	14.3	21.2
Males, left hip (39)	28.0	14.5	21.7
Females, right hip (38)	30.0	14.0	22.2
Females, left hip (38)	29.0	15.0	22.5
Average of the 154 hips			21.9

TABLE 1

In observing *Table 1,* one sees that the index is higher on the left side in both males and females and that the average index is higher in females than in males. These observations may relate to the known fact that there is a higher incidence in girls than in boys. From this study of 77 normal infants, it is felt that an acetabular index of 30 degrees or more is suggestive evidence of dysplasia; however, an index of less than 30 degrees does not rule out the diagnosis. This index is obviously a very rough measurement and it no doubt varies according to the position of the infant in relation to the x-ray tube. In fact, it should not be considered as final proof of the presence of this anomaly.

The epiphyseal center of the head of the femur tends to be decreased in size, less dense, and irregular in outline in this condition. The changes seen in this ossification center are probably due to lack of proper stimulation on the affected side. This is a very helpful and valuable diagnostic finding, but is of no aid during the first few months when the epiphyseal centers have not yet appeared.

The obturator-coxofemoral curve is formed by drawing a line along the superior margin of the obturator foramen and continuing this line across to the medial aspect of the femur and down along its surface (*Figs. 2-7*). In the normal hip this is usually a smooth unbroken curve. If the femur has been displaced superiorly any degree, this curve will be broken. This x-ray finding is very important and is often extremely useful in making a final decision in many questionable cases. However, in young infants this curve may be broken without hip dysplasia, since there is often a degree of physiological coxa valga in this age group. Therefore, this is a supportive sign.

Bruce's[7] measurements are of great value after the appearance of the osseous capital epiphysis. A horizontal line is drawn through the lowest tips of the ilia at the region of the triradiate cartilage and then lines are drawn from the lateral tips of the acetabula and perpendicular to the horizontal line. If the lateral edge of the acetabulum on the affected side is not discernible, then draw the perpendicular line on the normal side and construct other line equidistant from the center of the pelvis. Normally the epiphyseal center lies below the horizontal line and medial to the vertical line. In dysplasia with presubluxation the epiphyseal center will be in a normal position. If there is subluxation, the center will lie below the horizontal line but lateral to the vertical line. If

there is luxation or dislocation, the osseous center will be both above the horizontal line and lateral to the vertical line. These measurements are of great importance, but we must discover dysplasia of the hip joint prior to the time these measurements become of value in diagnosis.

DISCUSSION

The important features in the early recognition of congenital dysplasia of the hip are:

(A) History, usually of no practical value
(B) There is a very definite relationship between congenital clubfoot and this condition
(C) Physical findings
  (1) Relative immobilization of hip
    (a) Limited abduction
    (b) Less movement of extremity on affected side
  (2) Asymmetrical skin creases of the thigh
  (3) Elevated gluteal and popliteal folds on affected side
  (4) Jerk or click sign, pathognomonic if present
  (5) Measured shortening, may not be present prior to walking
  (6) Telescoping sign
(D) X-ray findings
  (1) Acetabular index: a rough measurement of deficiency of the upper acetabular margin
  (2) Epiphyseal center of the head of the femur, decreased in size and density
  (3) Broken obturator-coxofemoral curve
  (4) Displacement of the capital epiphysis

Our aim should be that every case be diagnosed before the onset of walking and, as stated previously, upon the first examination. In recent years it has become more apparent that in the examination of newborns and well babies certain observations, which are often neglected, are necessary in the early recognition of various pathologic conditions. As example of this type of observation is the routine palpation of the femoral arteries, which is an important diagnostic aid in the detection of coarctation of the aorta. Another important routine examination that every physician should perform is that of checking the lower extremities for any evidence of congenital dislocation of the hip. Only by doing this routinely will all the cases be discovered and referred to the orthopedic surgeon at the optimal time, before the onset of weight-bearing.

In many cases one will have difficulty in deciding whether or not the anomaly is present. Spontaneous cure in mild cases without treatment has been observed and it is true that perhaps some of the cases you refer would have never needed treatment. On the other hand, if there is sufficient evidence present to warrant the diagnosis, regardless of how minimal the findings, the case should be referred to the orthopedist. Some may say that the radiologic evidence in one or two of the six cases presented in this paper is inadequate for the diagnosis of congenital dysplasia of the hip. Certainly the x-ray findings in some of the presented cases are questionable and flimsy; however, it is felt that enough evidence was present on physical and x-ray examination to warrant the diagnosis and to prompt the author to refer the cases for orthopedic observation and therapy. The orthopedist agreed with the diagnosis in all six of the presented cases and all were subsequently treated. The diagnosis does not depend on any one finding, but upon the total evaluation of all findings.

Case 5 (*Fig. 6*) is an excellent example of a problematical case. This patient was first seen at the age of eight hours during a routine neonatal examination. The examination was negative except for relative immobilization of the right lower extremity with resistance to abduction of the right thigh and a clearcut jerk sign. The patient was referred to an orthopedist, who thought that the x-ray findings were not too convincing. However, the patient was treated by the orthopedist with a Frejka pillow splint, which was used only occasionally by the mother. The patient came in again at the age of eight months and the x-ray findings at that time were doubted by no one.

Case 6 (*Fig. 7*) further illustrates the importance of early physical findings. This patient was seen at 8 hours of age and there was an asymmetry of the femoral skin creases and the gluteal fold was elevated on the left side. There was resistance to abduction on the left and the jerk sign of Ortolani was present. Again, the x-ray findings were not too definite. The infant was treated with an abduction bar, but as can be seen in *Fig. 7B*, this was unsuccessful. This case shows that the early physical signs are extremely important, even more so than the x-ray findings. It also suggests that if definite luxation is present at birth (as shown by the jerk sign of Ortolani) the infant should be treated by extreme abduction in a plaster cast.

SUMMARY

The obvious importance of the early recognition of congenital dysplasia of the hip is stressed. Luxation and subluxation are the usual sequelae of this condition; however, many cases diagnosed in later life as osteoarthritis, degenerative hip disease, infection, Legg-Perthe's disease and malum coxae senilis probably represent late sequelae of congenital dysplasia of the hip.

The important physical and x-ray findings are discussed and summarized. These findings are illustrated by sketches and x-rays of six cases which have been observed during the past three

years. The difficulties which are inherent in arriving at a definite diagnosis are discussed. The important relationship between congenital hip dysplasia and congenital clubfoot is emphasized.

This challenge in preventive pediatric-orthopedic medicine will be met only by cognizance and subsequent early recognition.

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THE HISTOCHEMICAL APPROACH TO PATHOLOGY EXEMPLIFIED IN STUDIES ON GLOMERULAR DISAPPEARANCE*

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The histochemical approach to pathology has actually two parts. The first is one of viewpoint. The second part is one of methods and technics.[1]

In the attitude or viewpoint part of the histochemical approach to pathology there is a consideration of disease as far as possible in chemical terms. For example, we take the basophilic hyperchromatic cell with a large basophilic nucleus and a large nucleolus as representing active nucleoprotein synthesis. We think of the active nucleoprotein synthesis as occurring in malignant cells, and in actively growing cells whether in repair or in embryonic life. Similarly many other pathological processes are capable of being considered in chemical terms. The reaction between tissues and bacteria in very many instances can now be worked out in terms of the chemistry involved. For example, the propensity of the pneumonococcus with its carbohydrate capsule to involve tissues and surfaces where there is a mucinous lubricant is well known. The pneumonococcal pneumonia, empyema, peritonitis and arthritis are understandable upon these data, that the pneumonococcus needs carbohydrate for its growth and virulence and that mucinous surfaces contain carbohydrate.

The viewpoint having been directed toward the consideration in chemical terms, one has a large number of technics which are available for study. Although the ever advancing and increasing number of histochemical technics makes a collection of them at the present time a difficult procedure, enough of the technics have been indicated in Gomori's chapter,[2] in Lillie's book,[3] and in Glick's book[4] to provide a fairly good over-all survey. Granted that such a survey is possible, I should like to discuss with you the fashion in which histochemical technics have been used in the elucidation of a pathological process.

Everybody is familiar with the scarred hyaline knot which is found in the cortex of the kidney. Depending upon the amount and degree of disease these hyaline knots may be frequent or they may be sparse and scarce. With the ordinary hematoxylin and eosin stain they appear to consist of an eosinophilic homogeneous material with an occasional cramped, crowded nucleus. With other histological procedures more can be made out. For example, with the van Gieson stain, if the acid fuchsin is strong, the hyaline knot resolves itself into a yellow staining hyaline material and a red staining compressed core. Similarly with the Mallory Heidenhain or the trichrome stain of Masson or its variants similar structural details can be made out.

Using the PAS or periodic acid-Schiff's method[5] for the study of the hyaline glomerulus it is rapidly appreciated that the hyaline knot represents the gravestone of the glomerulus. There are (1) a peripheral basement membrane left and recognizable, (2) a hyaline material filling in the space of Bowman's capsule and, (3) a compressed thickened glomerulus. These are the changes found in arteriosclerotic scars as in the disease hypertension when it is associated with arteriosclerosis in sections colored with the PAS method.

Tracing back less changed but similarly altered glomeruli in the arteriosclerotic kidney one can find a sequence of events which I have illustrated in the monograph, "Medical Diseases of the Kidney."[6] The early stages were described by McGregor many years ago. The process of dis-

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appearance of a glomerulus in arteriosclerosis, which as McGregor suggested is due to ischemia, seems to begin with a wrinkling of the capillary basement membrane of the glomerulus. The wrinkling is followed by the deposit of a hyaline material internal to the basement membrane. The space of Bowman's capsule is filled with a hyaline material. Eventually, the glomerulus may remain simply as a hyaline scar. Sometimes the parietal basement membrane disappears.

These groups of findings in the arteriosclerotic kidney give us a means of recognizing the effects of ischemia on the glomerulus as it occurs in other diseases. It is being recognized more and more that ischemia and arteriosclerosis complicate the histological picture of the kidney in pyelonephritis and in glomerulonephritis, the other two large main classes of glomerular involvement.

Since the glomerulus occupies the central position in our study of the kidney, it is worthwhile to pause and consider for a moment why this pre-eminent position is given to the glomerulus. First of all, as far as we can make out at the present time, the whole of the blood flow through the normal kidney goes through the glomeruli before it reaches tubules or interstitial tissue. Damage in the glomerulus and alteration of its blood flow can produce, by itself, changes in the distribution of blood to the tubules and interstitial tissue. This can be blamed for lesions in the rest of the kidney. Again the reaction of the tubules may be protean. The tubules may atrophy or hypertrophy as Oliver[7] has demonstrated. Whenever there is protein in the glomerular filtrate the tubular epithelium may show colloid droplets.[8] Whenever there is fat in the glomerular filtrate the tubules may show fatty droplets in tubular epithelium,[8] and similarly for a great many other changes. On the other hand, the glomerular changes in disease are characteristic and they can be marked out for the large main classes of glomerular disease,[6] when studied in PAS-stained sections.

From the viewpoint of glomerular alteration the lesion of acute glomerulonephritis is quite simply and directly an acute diffuse inflammation of the glomeruli of both kidneys. It is mimicked in some cases in necrotic glomeruli in malignant hypertension. There is a similar appearance in many cases where there has been a very high polymorphonuclear leukocytosis.[9] However, as has been pointed out elsewhere,[6] the involvement of the interstitial or intercapillary space of the glomerulus in acute glomerulonephritis is characteristic and definitive. The further sequence of changes in glomerulonephritis takes the form of proliferation of capsular epithelium with the formation of the "crescent." It was pointed out long ago by Harvey[10] that tubular structures may appear in the "crescent." This has been fully illustrated recently by myself[6] and even more recently by Allen[11] who has described similar structures in the "crescent," calling them adenoid structures. In any event, no matter what you call them, they are characteristic of glomerulonephritis. In the chronic stages of glomerulonephritis one may find the hyaline knot of the glomerulus surrounded by a halo of new tubular structures which have basophilic cytoplasm, a small lumen, and a rather thick and conspicuous basement membrane. All this shown in the PAS preparations.

The changes in pyelonephritis are quite distinct and different. There is a striking infiltration of the glomerulus by inflammatory cells, usually from a point of adhesion between glomerulus and capsule. Fibrosis accompanies this, extending into a segment of the glomerulus. The eventual taking over of the glomerulus by fibrosis beginning in a segment is the characteristic feature of pyelonephritis. Fahr[12] and Schoen[13] and Davson[14] have recognized these appearances, very well seen in the PAS-stained sections.

The appearances of ischemia have already been described. Characteristic changes are produced also by Kimmelstiel-Wilson's intercapillary glomerulosclerosis[15] which have been fully described and will not be re-emphasized here. It is worth repeating, however, that the glomerulus which is affected by intercapillary glomerulosclerosis does not ordinarily show any of the signs of ischemia. Conversely the glomerulus which is involved diffusely by ischemia does not show the changes of intercapillary glomerulosclerosis.[16] This suggests that some filtration effect in the development of intercapillary glomerulosclerosis may be present.

Similarly characteristic changes can be made out in embolic glomerulonephritis where segments of glomeruli are involved in a scattered inconstant fashion. Lupus erythematosus disseminata has some of the features of the embolic lesion of the glomerulus. It has usually coagulated material which appears internal to the capillary filtration surface. This has the appearance of the so-called wire loop lesion.

Acute or malignant hypertension shows a number of arterial changes such as intimal elastosis of the interlobular arteries and probable necrosis of arterioles as well as many ischemic glomeruli. In the glomeruli the characteristic changes are produced by a thrombo-necrosis of the afferent arteriole. There are infarcted glomeruli which may have an acute inflammatory reaction in them and which may show something resembling "crescent" formation. These changes are presumed to represent incomplete necrosis of the glomerulus. They may be confused, as has been mentioned previously, with acute glomerulonephritis.

We have then by histochemical methods reviewed the pathology of the various types of glomerular involvement in disease (*Fig. 1*). The glomerular changes are shown up with a precision which allows a separation one from another. We know then something about the "what" of a number of glomerular diseases. We know also something about the "why" and "how" of some of these. In many others the "why" and the "how" are not clear. I should like to spend a few remaining minutes discussing with you the recent studies which Dr. Lupton and Mr. Harden, one of our medical students, and I[17] have made. They may elucidate something of the unexplained features of glomerular obsolescence.[18]

You will recall the alkaline phosphatase method of Gomori. This method in essence makes use of sections of tissue in which the alkaline phosphatase has not been destroyed by heat or by a poison in the fixative. Sections of tissue are incubated with the substrate, usually glycerophosphate, and a buffer to maintain the proper pH, and a calcium salt. The calcium salt precipitates the phosphate as formed by the phosphatase action from glycerophosphate. It can be shown that the precipitation of the phosphate occurs at the sites of phosphatase activity. The phosphate is then demonstrated as black cobalt sulphide after the calcium has been replaced by cobalt.

In the ordinary phosphatase method of Gomori glycerophosphate is used as a substrate. More recently the method has been extended to the use of hexodiphosphate as a substrate and

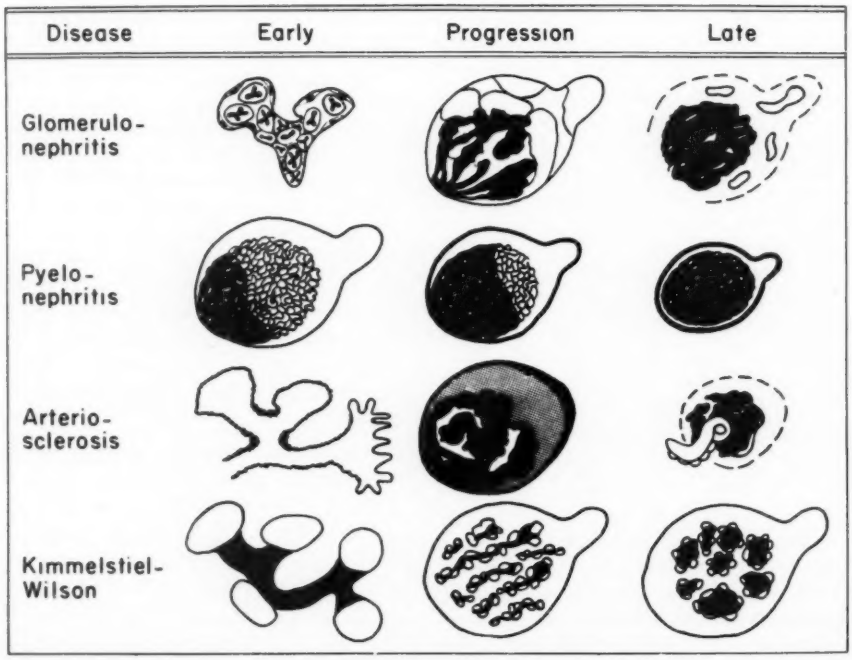

FIG. 1

Gomori,[20] Newman and others,[21] and our group at the University of Virginia have been using muscle adenylic acid as a substrate.

Muscle adenylic acid is adenosine-5-phosphate. It is a breakdown product of adenosine-triphosphate. It is also called 5-nucleotide. The enzyme which breaks down this 5-nucleotide can be called 5-nucleotidase or muscle adenylic acid phosphatase. It is quite specific and does not appear to be activated by magnesium or inhibited by magnesium. The two features of lack of activation and lack of inhibition by magnesium separates the 5-nucleotidase from the ordinary alkaline phosphatases.

The 5-nucleotidase of tissue has an interesting distribution and includes smooth muscle, particularly in the aorta and in some of the visceral arteries. In our experience the smaller renal arteries have not had the enzymes under normal conditions. The enzyme is present in many nerve structures in the central and peripheral nervous system, and it is especially strongly concentrated in the posterior pituitary, the thyroid and intestine. Strangely enough, it is present in obsolescent glomeruli.

Keeping on the main theme of this talk, the obsolescent and obsolete glomerulus, let me discuss the localization of 5-nucleotidase in the glomeruli. Studies by Drs. Lupton, Harden and me[17 18] upon this subject have been reported elsewhere. We have shown that 5-nucleotidase is concentrated in the hyaline filling, in the space of Bowman's capsule in ischemic glomeruli. They contain no ordinary alkaline phosphatase activity. Usually there is no hexodiphosphatase activity. In the glomerulus that is completely obsolete, that is when it is simply a hyaline knot, one does not find 5-nucleotidase activity. In other groups of glomeruli characteristic features of malignant hypertension may be seen. Here there is some 5-nucleotidase activity in the altered glomerulus as well as in the hyaline which fills up the space of Bowman's capsule.

In pyelonephritis, there is a diffuse concentration of 5-nucleotidase in the majority of glomeruli. In glomeruli which are in the process of being scarred due to pyelonephritis one finds the 5-nucleotidase distribution following pretty well that of the PAS-positive material, scarring and fibrosing the glomerulus.

We have not studied any case of acute glomerulonephritis. In a case of subacute glomerulonephritis, the 5-nucleotidase activity was shown to be concentrated in a damaged glomerulus rather than in the "crescent" in the space of Bowman's capsule which is the distribution in the ischemic glomerulus.

We have studied a number of cases of Kimmelstiel-Wilson's intercapillary glomerulosclerosis, and there is no particular concentration of 5-nucleotidase in the hyaline intercapillary material. This is another good evidence for the special nature of intercapillary glomerulosclerosis marking it out from ischemia and from the other types of alteration of glomeruli.

I believe that we have reviewed the natural history and development of a hyaline knot in the cortex of the kidney in sufficient detail to indicate that there are many diseases from which the hyaline knot may develop. By studying this hyaline knot histochemically one can make out several of the varieties of disease. The ordinary hematoxylin and eosin stain shows features in all which are indistinguishable, one from another. However, with the PAS method these hyaline knots do show striking differentiating features and can be recognized as resulting from a particular disease.

In addition and presented just as unfinished business there is the matter of the 5-nucleotidase activity in obsolescent glomeruli. The characteristics of diseases which have been seen with the PAS method can be recognized also in the 5-nucleotidase preparation. It is too early to say what the presence of 5-nucleotidase in glomeruli means. However, it is worth pointing out that the nucleotides are essential materials, physiologically important in making up the co-enzyme system. There is a great deal of evidence that poisoning with nucleotides may have something to do with the shock which follows body injuries.[22]

It is perhaps not too broad a hypothesis to suggest that some of the features of other body diseases which have an increased amount of 5-nucleotidase in the tissues, as in some of these kidney diseases, may be associated with an overdestruction of the nucleotides by diseased tissues. This is a hypothesis with little substantiation. It is presented in order to indicate one of the fashions in which the histochemical approach to pathology may be leading to practical consideration of disease.

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EXTRA-MAMMARY PAGET'S DISEASE*

DISCUSSION OF PATHOGENESIS

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Paget's disease of the breast was first described in 1874. Histologically similar lesions occur in other parts of the body, the so-called extra-mammary Paget's disease. The pathogenesis of both mammary and extra-mammary Paget's disease has been the subject of many studies.[1 2 3] The pagetoid changes are thought by some to be primarily epidermal with extension of the process into the dermis. Others believe the epidermal changes are secondary to an underlying carcinoma. To investigate this problem serial sections were made of a cutaneous implant of a papillary epidermoid carcinoma in which the epidermis showed pagetoid changes. The sections illustrate principles applicable to the pathogenesis of extra-mammary Paget's disease. They are the subject of this report.

CASE HISTORY

A 50-year-old white farmer, H. G. S., Acc. No. 132326, had a suprapubic cystostomy in 1935 for removal of multiple urinary bladder tumors. One year later fifteen 1 to 10 mm. papillary epidermoid carcinomas Grade I were removed by transurethral fulguration. Recurrent urinary bladder tumors were fulgurated in 1938, 1939 and 1941. In 1950 a second suprapubic cystostomy was performed with removal of several papillary tumors and excision of the old midline abdominal scar.

At operation a cystic mass 1.5 cm. in diameter occupied the superior pole of the scar. It was confined to the skin of the abdominal wall. There were no adhesions between the scar and the urinary bladder. The mass was first observed by the patient fifteen years before, soon after the initial suprapubic cystostomy. It had slowly increased in size, and had remained essentially asymptomatic.

Gross pathology description is as follows: The specimen is an ellipse of skin and subcutaneous tissue measuring 7.0 x 1.5 x 1.5 cm. containing a centrally placed linear, white, shiny, healed surgical scar. The upper pole of the scar contains a discrete, cystic, slightly elevated, non-ulcerated, reddish-blue, round mass 1.5 cm. in diameter.

Microscopic studies show that the epidermis is studded with lacunae containing from one to thirty pagetoid cells. These cells are large, round and symmetrical. Their cytoplasm is either clear or foamy, and moderately rich in carbohydrate as demonstrated by PAS and R and O staining reactions. The nuclei are well preserved, large, distinct and contain prominent nucleoli. Mitotic cell division is infrequent. Pagetoid cells are scattered throughout all levels of the epidermis. Although they are more numerous in the basal and prickle cell layers, groups of tumor cells are present in the granular layer and some are being exfoliated (*Fig. 1*).

The dermis and upper subcutaneous tissue are partially replaced by a papillary cystic epidermoid carcinoma. The characteristic cell is large, discrete and vesicular with prominent nucleus and nucleolus. The cytoplasma is rich in PAS positive material possibly glycogen. The tumor features an intracystic papillary growth pattern. The stromal projections are covered with transitional type epithelium. The tumor is surrounded by compressed connective tissue without evidence of encapsulation. Some of the skin appendages are unaltered while others are partially destroyed or completely replaced by carcinoma (*Fig. 1*).

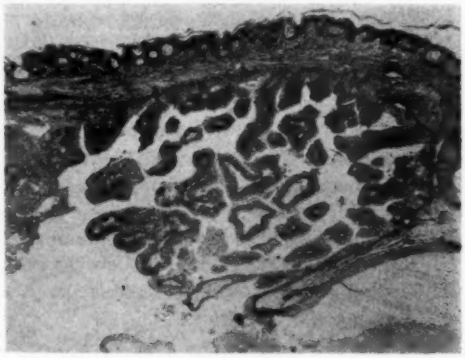

FIG. 1

Lesion of abdominal wall illustrating relationship of cutaneous implant to the epidermis (H. and E. x 30).

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DISCUSSION

The intra-epithelial tumor cells apparently are not of epidermal origin. This is supported by the absence of intercellular bridges and keratohyalin granules. There is no evidence of transition between epidermal and pagetoid cells, and there is a difference in morphology and staining reactions (*Fig. 2*).

The mechanism of the transmission of the intradermal carcinoma to the epidermis is one phase of the pathogenesis of Paget's disease. The intra-epithelial spread is another. The three common routes of carcinomatous dissemination were investigated, namely: direct spread, extension along skin appendages and metastasis. This tumor does not extend directly to the epidermis. Frequently the carcinoma extends to within a few microns of the epidermis but is always separated from it by a narrow zone of dermis. The skin appendages have been suggested as a possible avenue for the transdermal and intra-epithelial spread. Each skin appendage can be followed through serial sections and this route of dissemination is excluded. *Fig. 3* illustrates a large dermal metastasis lying within an endothelial lined space. The metastasis approaches the epidermis in subsequent sections and encounters the rete malpighii (*Fig. 4*). The metastasis is absorbed into the epidermis finally evolving into a characteristic pagetoid nest (*Figs. 5* and *6*). Multiple Paget cell nests can be followed in serial sections until they fuse with adjacent cell nests. The composite picture is one of a solid mass of tumor invading all levels of the epidermis. The isolated cell nests represent only a segment of the fused tumor mass. The spread of the tumor from the dermis and throughout the epidermis may be compared with

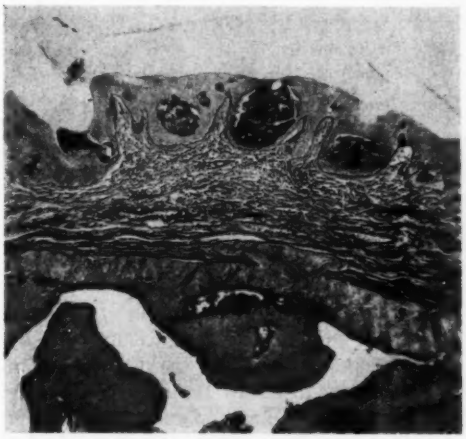

FIG. 2

Ritter-Olson staining reaction showing similarity of intra-epithelial pagetoid cells and dermal carcinoma (R. and O. x 95).

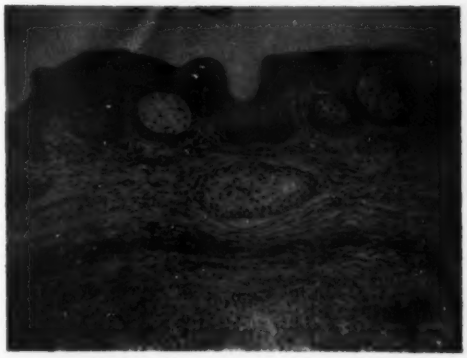

FIG. 3

Dermal metastasis lying within an endothelial lined space (H. and E. x 130).

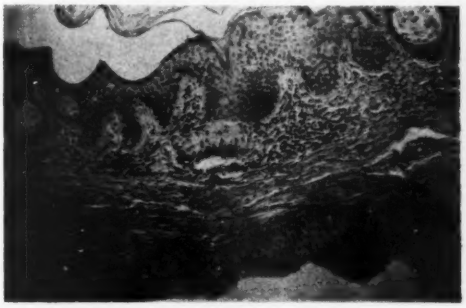

FIG. 4

Dermal metastasis adjacent to rete malpighii (H. and E. x 130).

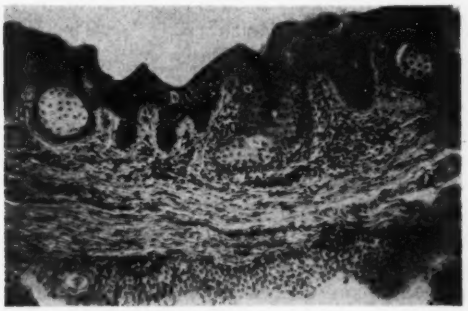

FIG. 5

Dermal metastasis is partially surrounded by basal cells of rete malpighii (H. and E. x 130).

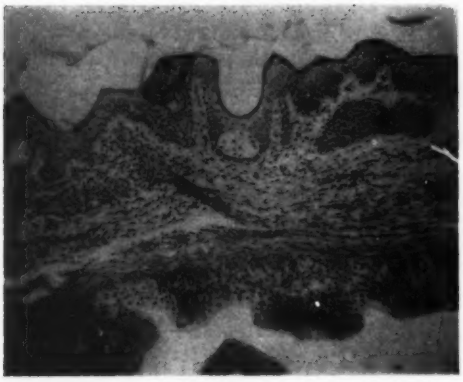

FIG. 6

Dermal metastasis is incorporated within the epidermis and has the appearance of a Paget cell nest (H. and E. x 130).

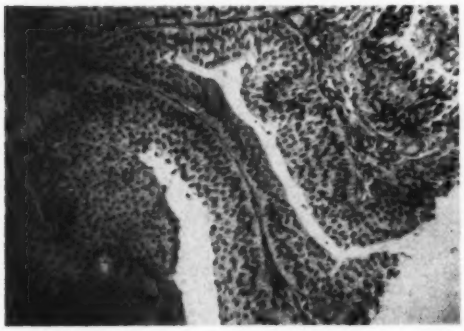

FIG. 7

Papillary epidermoid carcinoma grade I of the urinary bladder (H. and E. x 190).

the familiar "collar-button" abscess. The past problem in establishing the pathogenesis of Paget's disease may indeed be a reflection of this growth pattern.

It is difficult to prove that the intradermal carcinoma represents a cutaneous implant of a urinary bladder carcinoma (*Fig. 7*). The evidence to support this relationship is chiefly histological. The clinical history is of little value since no one has observed enough cases of this type to describe the natural history of such a lesion. The histological similarity between the intradermal and the urinary bladder carcinoma has been observed independently and repeatedly by several pathologists. The significance of the PAS method staining reaction is not clear. The quantitative and qualitative 1, 2 glycol contents of the two lesions are similar. The location of the lesion in the abdominal scar suggests a relation to the urinary bladder carcinoma. The lesion is not in the ano-genital region, the common site of extra-mammary Paget's disease. Each skin appendage can be followed in serial sections and the carcinoma does not arise in either hair follicles, sweat glands or sebaceous glands.

The lesion from the abdominal wall has basically the histological characteristics of Paget's disease occurring in the breast, and in extra-mammary sites. It is likely that the pathogenesis of this lesion as described and illustrated may be applicable to mammary and extra-mammary Paget's disease of the skin.

CONCLUSION

An unsual case of neoplastic cells growing within normal epithelium of the abdominal wall is presented as an example of extra-mammary Paget's disease. The tumor cells came from a cutaneous implant of a papillary epidermoid carcinoma of urinary bladder origin.

The mechanism of the intra-epithelial spread in this case may be applicable to the pathogenesis of Paget's disease.

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THE EARLY TREATMENT OF THORACICO-ABDOMINAL WOUNDS*

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The term "thoracico-abdominal" is used to designate those wounds in which the pleural and abdominal cavities and the diaphragm have all three been traversed or otherwise injured and is not applied to separate wounds of the thorax and abdomen.

Thoracico-abdominal injuries are considered primarily as abdominal wounds complicated by varying degrees of trauma to the diaphragm and lung. In many instances the amount of lung damage is relatively minimal and would not, in itself, warrant a thoracotomy. The necessity of

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performing a laparotomy in the case of obviously injured or possibly injured intra-abdominal viscera is well established. By the same reasoning it is necessary to explore a thoracico-abdominal wound. The obtaining of adequate exposure of the inaccessible recesses of the upper boundaries of the peritoneal cavity constitutes one of the main problems in treating this class of injuries. The other problem is one of correcting altered cardio-respiratory physiology. This physiology is altered either by the injury to the thorax or as a result of opening the pleural cavity to obtain exposure adequate for repair of damaged structures.

In order to obtain full benefit of the advantages afforded by the thoracic approach one must understand the problems associated with alterations in the cardio-respiratory equilibrium and must be ready to correct these disturbances.

If wars have ever been productive of anything of value, they may be credited with the production of various types of trauma, for our consideration here, of thoracico-abdominal injuries, of sufficient magnitude and in sufficient numbers to allow surgeons to develop and to put into practice operative measures not previously employed.

Advantages of the Thoracico-Transdiaphragmatic Approach.—With the chest open a thorough cleansing of the pleural cavity can be effected by lavage with warm water. The pleural cavity often is grossly contaminated by perforated intra-abdominal hollow and solid viscera. This soiling develops in a retrograde manner through the tear in the diaphragm. Repair of lung and diaphragm injury and thorough cleansing of the pleural cavity are necessary in maintaining a low incidence of empyema.

Operative Approach.—The diaphragm is usually opened by extending the perforation in it in that direction which will give the best exposure of the injured viscera beneath it. If compatible with good exposure, an attempt is made to make the enlargement in the direction of the fibers of the diaphragm.

When the incision is one of election it is made through the ninth or tenth interspace or by resecting the ninth or tenth rib. If one wishes to extend the incision across the costal arch, having used an incision through the bed of the resected tenth rib or through that interspace, he need only lower the incision at its anterior pole to the interspace between the tenth and eleventh ribs and avoid cutting across cartilage, since in most patients this portion of the costal arch will be fibrous instead of cartilagenous.

Some surgeons advocate using a separate laparotomy incision in addition to the thoracotomy, should transdiaphragmatic exploration of the abdominal cavity reveal lesions or the possibility of lesions that cannot be adequately exposed through the diaphragm. Others advocate extending the thoracic incision through the costal arch and across the abdominal wall, a thoracico-abdominal incision. Objections to the latter incision are that it may create instability of the chest and enhance the chances of postoperative pulmonary complications and that it predisposes the costal cartilage, if cut, to infection.

This incision has been used numerous times in cases both with and without existing costal arch injury. Colostomy has been performed in some of the cases. A stable chest wall has resulted after closing the incisions and infection has not been a problem.

Both the separate laparotomy incision and the thoracico-abdominal incision are applicable and are equally satisfactory. I prefer the thoracico-abdominal incision, particularly on the left. It has been my experience that when one encounters this situation, namely, need of additional exposure to that obtained by the thoracico-transdiaphragmatic incision, the separate laparotomy incision will prove to be the one of choice in right-sided injuries and the thoracico-abdominal incision the one of choice on the left.

Considerations as to Side Involved.—The seriousness of thoracico-abdominal injuries may be considered in regard to the number of intra-abdominal viscera that are damaged. The anatomical position of the viscera allows for classification of the wounds as to the side of the body involved. When the wound is a perforating one the trajectory of the missile may be projected by lining up the wound of entrance with the wound of exit and some idea as to organs involved may be fairly well predicted. When the injury is a penetrating one the course of the missile cannot be so well visualized. Antero-posterior and lateral x-ray views of the chest and abdomen or stereoscopic views will be of great help in locating the position of a retained foreign body or bodies and often by studying such x-ray films the course of the missile can be traced by flecks of opaque material which are left in its wake.

When the right diaphragm is traversed the liver is almost always injured. The liver often acts as a barrier preventing damage to other organs. However, when an intraperitoneal organ other than the liver is injured from the right side it usually means that the entire substance of the liver has been traversed by a missile or a transmitted force and serious damage has been inflicted.

In left-sided injuries more intra-abdominal organs are apt to be involved and from that viewpoint they may be considered more dangerous than right-sided ones. However, abdominal visceral injury sustained from the right is usually more serious because of the associated damage to the liver.

Wounds of the Liver and the Necessity of Closing Perforations of the Diaphragm.—In reporting a series of 330 cases of abdominal wounds treated in an evacuation hospital in World War II, Mediterranean Theatre, Imes[1] states that the liver was injured 78 times.

"In four cases in which small (less than 0.5 cm. in diameter) missiles were apparently retained in the liver, from roentgenographic study, and in which there was no clinical evidence of other visceral injury, exploration was not done. These four patients recovered uneventfully."

This is quoted because the question of how to handle solitary small penetrating wounds of the liver is one that often arises. Many such injuries of the liver and diaphragm if treated conservatively or if overlooked will be followed by bile empyema and subphrenic abscesses. Many surgeons have, however, a small series of cases of small penetrating wounds of the liver treated similarly to those reported by Imes. In general, though, these injuries are so liable to complications that they are, with few exceptions, best treated by exploration, preferably by thoracotomy, in order to obtain firm closure of the diaphragm. Ample drainage to the site of liver injury is mandatory.

Tuttle[2] reports two incidences of late treatment in cases where wounds of the diaphragm were overlooked.

"They were both on the right and there were accompanying wounds of the liver. Each developed a biliary-pleural fistula with subsequent infection of a large overlying hemothorax. Bronchial fistulae were also present. Decortication of the lung with closure of the bronchial fistulae had to be done in each instance. In one an excellent result with complete expansion of the lung and removal of the tubes in 10 days was accomplished; in the other, the bronchial fistula reopened, the lung collapsed, and a chronic empyema had to be accepted."

On the right side, even though the diaphragm be well sutured, the complication of biliary pleural fistula may develop if an adequate exit for bile is not provided in the form of subcostal drainage. Bile may accumulate beneath the diaphragm and break through the suture line into the pleural cavity.

Small lacerations, fractures, and penetrating wounds of the liver may be sutured. I practice packing large wounds. The packs are loosened on the seventh day and finally removed on the tenth or eleventh day, having been shortened each day after the seventh. Care is taken to prevent sealing over of the drainage tract from above by forcing the tract to close by granulations coming up from below. This is done by loosely packing the tract each day until obliterated.

Whether sutured or packed, adequate external drainage is necessary. I do not hold with the view taken by some that external drainage should be avoided if possible on the grounds that secondary infection results in a retrograde manner from without. Any infection produced in this manner has been minimal in my experience and has been taken care of by the external drainage. The advantage of affording an exit for the escape of bile offsets in my mind any small possibility of introducing by a drain or pack secondary infection into the liver.

The necessity of closing perforations of the diaphragm is well recognized. Only small openings on the left and small openings on the right located near the midline can be adequately closed from below. The best closures on either side are made from above.

The Management of Injuries to Specific Intra-Abdominal Viscera.—When injured, the spleen is best treated by removal. In so doing active hemorrhage is controlled and the possibility of delayed hemorrhage is removed. Removal of the spleen does not interfere with the normal functioning of the human organism.

The stomach and small intestine when perforated should be treated by suture or by resection and primary anastomosis according to the extensiveness of the trauma. The pancreas when injured should be drained.

Drainage and packing of kidney wounds is often indicated. Nephrectomy is seldom neces-

sary. Adequate kidney function and satisfactory healing are the rule even in extensive kidney injury.

When the colon is involved one is immediately faced with the decision as to whether to suture or exteriorize the injured segment. Although primary suture or resection and primary anastomosis are the procedures of choice in a prepared colon it will often be necessary to exteriorize the injured segment because adequate preparation for primary anastomosis has not been possible.

Closure of Lung Lacerations.—Many operators routinely suture all lacerations of the lung using either absorbable or non-absorbable suture materials. Others make a practice of suturing only those lacerations which are bleeding and in which there is a bronchial fistula demonstrable on inflating the lung under positive pressure. Both procedures are satisfactory. I prefer suturing all lacerations with absorbable material.

Phrenic Nerve Crushing.—It is often of advantage to have the diaphragm immobilized by phrenic nerve crush in order to obtain closure in poorly accessible areas. I have noted no untoward postoperative pulmonary complications attributable to the paralyzed diaphragm and do not hesitate to crush the phrenic nerve when immobilization is desired.

CONSIDERATIONS REGARDING CARDIO-RESPIRATORY PHYSIOLOGY IN THORACICO-ABDOMINAL INJURIES

(A) *Shock.*—Although the general concepts of resuscitation of the injured apply as well to those with thoracico-abdominal wounds, as to those with abdominal wounds, still the former group requires additional attention towards the disturbed or potentially disturbed cardio-respiratory equilibrium. This disturbance will, of course, be found in varying degrees. No routine can be adopted for all cases, but emphasis can be placed upon some of the problems which this altered physiology presents and upon some of the means at one's disposal for correcting them.

Difficulties at times arise in the administration of intravenous fluids because of the potential dangers of overloading a circulatory system already embarrassed by direct pulmonary trauma, hemothorax, pneumothorax, or a combination of these. The damage within the peritoneal cavity, hemorrhage or peritoneal contamination, may in itself call for, ideally, more vigorous and more rapid restoration of blood volume than the pulmonary system can tolerate. Often adequate restoration of blood volume can be obtained only after an impaired cardio-respiratory imbalance has been improved or corrected. This can at times be corrected preoperatively or may not be accomplished without the intervention of surgery.

(B) *Thoracentesis.*—Aspiration of the pleural cavity preoperatively can be, and often is, of great help in relieving cardio-respiratory embarrassment. Hemopneumothorax is, however, not always present and aspiration may not be indicated. The wound edges may remain in close apposition following injury and the chest may not actually "suck air." Pneumothorax will develop, however, as soon as the wound in the chest wall is explored or when the abdomen is opened. In the latter case air will enter the pleural cavity in a retrograde manner through the opening in the diaphragm. Hemothorax is often retrograde from laceration of liver or spleen.

Although some patients arrive in acute respiratory distress and air and blood are immediately evacuated from the pleural space to give relief, many cases are in such condition that, without hazard, an x-ray examination, preferably in the upright position, can be made and an intelligent appraisal of the presence of and degree of air and fluid in the chest can be made. Thoracentesis is then performed or omitted according to the findings.

(C) *Intercostal Nerve Block.*—Intercostal nerve block with procaine or preferably with one of the longer acting oily solutions such as nupercaine® in oil is invaluable in relieving pain and thereby allowing better aeration of the lung. This procedure may be used in the preoperative, operative, or postoperative phases of the patient's treatment, and may be repeated as often as indicated without any harmful effects.

(D) *Tracheobronchial Aspiration in the Preoperative, Operative, and Postoperative Phases.*—Patients often arrive with blood and pulmonary secretions in their trachea and bronchi. Careful attention to the removal of these is one of the cardinal points in their treatment. This may be accomplished by having the patient cough spontaneously; by introducing an intratracheal catheter which will mechanically remove some secretions in addition to inducing the cough reflex by irritation; and thirdly, by bronchoscopy. The use of the bronchoscope in the care of the injured plays an important role.

(E) *Postoperative Expansion of the Lung.*—In using the transdiaphragmatic approach the desired end result as far as the lung is concerned is full expansion as soon as possible. This is accomplished by expanding the lung under positive pressure so that it comes out to the chest wall and remains there while the chest is finally closed in an air-tight manner.

Catheter-water-trap drainage of the pleural space after thoracotomy is a well recognized procedure and is widely used with good results. Early lung expansion is the objective. This objective is often achieved and maintained by positive pressure expansion alone at the time of closing the chest. Aspiration of air and fluid from the pleural cavity is often necessary whether the pleural cavity is or is not drained. Since pneumothorax can develop from leakage around the catheter and from accidents to the drainage bottle and since the technic of catheter-water-trap drainage by no means eliminates entirely the necessity of aspirating the pleural cavity, I frequently practice positive pressure expansion of the lung and air tight closure of the chest wall and depend on needle and syringe aspiration of air and fluid from the pleural cavity in the postoperative course.

(F) *Anoxia.*—One of the problems, and perhaps the most immediately serious one, in thoracic surgery is that of contending with hypoxemia: the recognition and correction of it and the prevention of its going into irreversible anoxia and death. A rising blood pressure and a slow pulse are its cardinal signs and they must be combated by the administration of oxygen, mechanical obstructions of the air passages such as tracheo-bronchial secretions, pneumothorax and hemothorax having been removed. Oxygen under these conditions seems best administered by a nasal catheter properly placed or even better by means of the Boothby mask, at a rate of eight liters per minute.

IN CONCLUSION

We have presented and discussed the treatment of various injuries which involved simultaneously the peritoneal and pleural cavities and the organs therein.

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CONTINUOUS SPINAL ANESTHESIA IN THE TREATMENT OF SEVERE PREECLAMPSIA AND ECLAMPSIA*

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Since early in 1948 continuous spinal anesthesia has been used in the treatment of most of the patients with severe preeclampsia and eclampsia admitted to the Medical College of Virginia Hospitals.

In 1949 we[1] published a preliminary report of twenty-four patients treated with continuous spinal anesthesia. We now have 49 patients treated since our original report. At this time we wish to present some observations on the seventy-three patients. Thirty-five had severe preeclampsia and thirty-eight had eclampsia with convulsions. Two patients with eclampsia admitted to the hospitals postpartum are included in this report.

We are indebted to Hingson and Edwards for interesting us in caudal anesthesia in the treatment of patients with eclampsia. We have consulted Dr. Hingson for advice many times.

Hingson and Edwards[2] in 1943 reported the use of continuous caudal anesthesia in the management of twelve patients with severe toxemia of pregnancy. They stressed the following observations in their series: slow and progressive fall in blood pressure, an increase in urinary output, the control of convulsions without other forms of sedation, the rapidity with which patients regained consciousness and became cooperative, and the low fetal and maternal mortality.

We have had more success with continuous spinal anesthesia than we had with continuous caudal anesthesia. We realize that this method of treating patients with severe preeclampsia and eclampsia is still in an experimental stage, it should be used with caution, and only in hospitals with anesthetists trained in the use of spinal anesthesia or by obstetricians with special train-

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ing. We believe our results with this method of treatment justify a further investigation with a larger series.

No attempt was made to select patients for this study, except that our most severe preeclamptic and all undelivered eclamptic patients were treated with continuous spinal anesthesia.

In the thirty-eight cases with eclampsia, the convulsive seizures commenced antepartum in 23 patients, intrapartum in eleven patients, and postpartum in four patients.

Table 1 shows the age incidence. The youngest patient was 14 years of age and the oldest was 41. In our experience, eclampsia occurs frequently in young women, and 47.9 per cent of the patients in this report were under 20 years of age.

Table 2 shows that most patients with severe preeclampsia and eclampsia had either inadequate or no prenatal care. Only 3 of the patients in this report had prenatal care that could be considered nearly adequate. Fifty-four had either seen a physician or registered in a clinic, but they had not returned for regular prenatal care. Sixteen had no prenatal care of any type. Sixty-nine of the patients were Negroes and 4 were white. All of the patients were admitted to the ward service.

INCIDENCE IN REFERENCE TO AGE

Age in Years	No. of Cases	Per Cent
14 to 15	6	8.2
15 to 20	29	39.7
20 to 25	20	27.4
25 to 30	7	9.6
30 to 35	5	6.9
35 to 40	4	5.5
40 to 45	2	2.7
Total	73	100.0

TABLE 1

INCIDENCE IN REFERENCE TO PRENATAL CARE

Care	No. of Cases	Per Cent
Adequate	3	4.1
Inadequate	54	74.0
None	16	21.9
Total	73	100.0

TABLE 2

Table 3 shows that approximately two-thirds of the patients were primiparas.

Table 4 shows the number of convulsive seizures that occurred prior to the administration of continuous spinal anesthesia and the number of convulsive seizures that occurred during the treatment with continuous spinal anesthesia, both before and after delivery of the patient. The type of eclampsia is indicated for each case.

In *Table 5* we have recorded the average blood pressure on admission to the hospital and during the treatment with continuous spinal anesthesia. The average duration in hours that the spinal anesthetic was administered before delivery and after delivery is shown. We used metycaine® (gamma-2-methyl-Piperidino)-propyl benzoate hydrochloride) as the anesthetic for all cases in this report. We have tried to avoid sudden and rapid changes in the blood pressure level. This may explain the occurrence of convulsive seizures in some patients after the treatment had been started. We think the blood pressure should be lowered gradually.

Table 6 shows the method of delivery. Nineteen babies were delivered by cesarean section and all were alive and survived.

INCIDENCE IN REFERENCE TO PARITY

Parity	No. of Cases	Per Cent
Primiparas	48	65.8
Multiparas	25	34.2
Total	73	100.0

TABLE 3

TREATMENT

As soon as possible after admitting a patient with severe preeclampsia or eclampsia, she is placed in a quiet, darkened room, and given dilaudid® grains 1/20 hypodermically. If the patient is in labor or if she is an eclamptic not in labor, a continuous spinal anesthesia is started immediately.

An initial dose of 0.5 cc. of 1.5 per cent metycaine® solution (7.5 mg.) is then injected. The blood pressure is recorded after 5 minutes and again after 10 minutes. After the initial recordings the blood pressure should be obtained every 15 minutes. Subsequent injections are given at 15 or 30 minute intervals. As a rule, 0.5 cc. at

15-minute intervals is all that is required. We never give more than 1 cc. at any one injection unless the patient is ready for delivery. The blood pressure readings will indicate the necessity for the frequency and the amount of solution required. The smallest amount that will produce the desired effect is the proper dose to use.

CONVULSIVE SEIZURES PRIOR TO AND DURING SPINAL ANESTHESIA: TYPE OF ECLAMPSIA

Case	Convulsions Prior to Spinal	Convulsions During Spinal Bef. Del.	Convulsions During Spinal Aft. Del.	Total No. Convulsions	Type of Eclampsia
S. P.	3	0	0	3	Antepartum
J. W.	7	0	0	7	Antepartum
E. M.	11	0	0	11	Antepartum
D. B.	8	0	0	8	Postpartum
M. M.	0	2	0	2	Intrapartum
S. W.	4	0	0	4	Antepartum
A. C.	5	0	0	5	Intrapartum
G. C.	11	0	0	11	Antepartum
E. J.	15	1	0	16	Antepartum
M. D.	1	0	0	1	Antepartum
M. R.	10	1	0	11	Antepartum
B. J.	27	0	0	27	Postpartum
R. M.	3	1	0	4	Antepartum
G. S.*	2	14	0	16	Intrapartum
L. R.*	0	0	4	4	Postpartum
G. J.	5	9	0	14	Antepartum
A. H.	6	2	0	8	Intrapartum
Z. G.	1	0	1	2	Antepartum
D. G.	6	0	0	6	Antepartum
I. R.	4	0	0	4	Intrapartum
R. O.	4	7	3	14	Antepartum
S. B.	0	1	0	1	Intrapartum
E. H.	2	0	0	2	Antepartum
S. C.	4	0	0	4	Intrapartum
L. C.	8	1	0	9	Antepartum
M. M.	6	1	0	7	Antepartum
D. W.	6	2	2	10	Intrapartum
B. J.	7	1	16	24	Antepartum
M. R.	10	0	4	14	Intrapartum
G. C.	5	14	0	19	Antepartum
W. W.	0	0	1	1	Postpartum
L. T.	4	0	0	4	Antepartum
J. M.	0	2	0	2	Antepartum
B. M.	4	4	2	10	Antepartum
R. W.	5	1	1	7	Intrapartum
B. C.	8	20	0	28	Intrapartum
J. J.	9	0	0	9	Antepartum
M. J.	3	0	0	3	Antepartum
Total	214	84	34	332	

*Died after delivery.

TABLE 4

A venipuncture is done and blood is drawn for the following determinations: (1) blood sugar, (2) nonprotein nitrogen, (3) uric acid, (4) carbon dioxide combining power, (5) total and fractional proteins, (6) type, Rh and cross matchings of blood. The venipuncture needle is then strapped in place.

Intravenous fluids are then started through the needle already in place. The following solutions are given: (a) 400 cc. of 10 per cent dextrose solution in distilled water, (b) 80 cc. of sodium lactate solution, (c) 1.2 mg. of digitoxin.

The intravenous fluids are allowed to run in slowly. A similar volume of dextrose is usually given every four hours until the patient can take the necessary amount by mouth. If a patient has anuria or a very limited urinary output, the volume of intravenous fluids is limited to 250 cc. of 10 per cent glucose solution every 4 fours. If, after the initial blood chemistry is reported, the carbon dioxide combining power is below normal, additional sodium lactate is added to the

AVERAGE BLOOD PRESSURE ON ADMISSION AND AVERAGE AFTER SPINAL ANESTHESIA; AVERAGE DURATION OF SPINAL AND AVERAGE AMOUNT OF METYCAINE® REQUIRED

No. Cases	Average Blood Pressure: On Admission	Average Blood Pressure: With Spinal	Average Duration of Spinal (Hours): Prior to Delivery	Average Duration of Spinal (Hours): After Delivery	Average Duration of Spinal (Hours): Total	Average Metycaine® Milligrams
Preeclampsia						
35	190/123	155/100	23	12.9	35.9	602
Eclampsia						
38	180/115	152/97	21	32	53	994

TABLE 5

INCIDENCE OF TYPES OF DELIVERY AND FETAL RESULTS

Type of Delivery	Number Delivered	Fetal Results: Stillbirths	Fetal Results: Live Births
Spont. vaginal delivery	22	5	17
Forceps delivery	26	2	24
Breech extraction	4	2	2
Version and extraction	2	1	1
Cesarean section	19	0	19
Hysterotomy	1	1	0
Total	74	11	63

TABLE 6

subsequent dextrose injections. The patient should receive a maintenance dose of digitoxin (0.2 mg.) daily.

As soon as the blood pressure is controlled and the level of the anesthesia is up to the umbilicus, the perineum is prepared for examination. A pelvic examination is done to evaluate the pelvis and to ascertain the condition of the cervix. At this time a Foley catheter is placed in the bladder; and it is drained every hour and the urinary output recorded.

Special attention is given to the level of the anesthesia. It is not difficult to determine the level in a conscious patient. This is accomplished by testing the area of skin anesthesia. However, in the case of an unconscious eclamptic patient it is often quite difficult. In these patients the excursion of the intercostal muscles is observed closely. If there is any question about the level of anesthesia's being too high, further injections of metycaine® are discontinued until we are certain of the existing level.

The air passages are freed of mucus and nasal oxygen is administered in all patients with any indication for this type of treatment.

As soon as the patient becomes conscious and can cooperate, she is given orally 200 cc. of sweetened fruit juice or water every hour or two.

When the patient is ready for delivery, additional anesthesia is needed. This is obtained by placing the patient in a sitting position and by injecting 2 cc. of metycaine® slowly. This sitting position is maintained for fifteen minutes when possible. The level of anesthesia is then checked, and, as a rule, it is adequate for delivery.

Table 7 shows the number of stillbirths and neonatal deaths, and the gross fetal mortality. Eliminating four babies dead *in utero* when the mothers entered the hospital, two premature babies weighing 610 grams and 1,757 grams, respectively, and one baby from a patient with extensive premature separation of the placenta, we have five babies left that might have survived, giving a corrected fetal mortality rate of 7.4 per cent.

INCIDENCE OF STILLBIRTHS AND NEONATAL DEATHS

	Number	Per Cent
Total stillbirths	11	14.9
Neonatal death	1	1.3
Gross fetal mortality	12	16.2

TABLE 7

STILLBIRTHS

(1) E. M. The fetal heart tones were not heard on admission. The patient had a total labor of 28 hours. The babies were delivered spontaneously. They were macerated, and weighed 7 pounds, 3 ounces, and 7 pounds, 7 ounces, respectively.

(2) M. G. The baby was alive just prior to delivery as evidenced by the presence of the fetal heart sounds. The baby was delivered by breech extraction and was stillborn. Weight, 7 pounds, 1 ounce.

(3) M. D. Hysterotomy was performed for the interruption of a pregnancy of 24 weeks' duration. This produced a stillborn fetus weighing 610 grams.

(4) L. B. The fetal heart tones were present on admission. The patient had a total labor of thirteen and one-half hours. The baby was delivered spontaneously and weighed 3 pounds, 14¾ ounces (1,757 grams).

(5) L. R. The fetal heart tones were not heard on admission. The patient had a precipitous labor of 38 minutes. There was approximately 50 per cent premature separation of the placenta. The baby weighed 2 pounds, 9 ounces. The mother died.

(6) G. S. The fetal heart tones were present on admission. The patient had a total labor of 27 hours. The baby was delivered spontaneously and weighed 5 pounds, 1½ ounces. The mother died.

(7) A. H. The fetal heart tones were 50 per minute on admission. The patient had a total labor of 25 hours. The baby was delivered by midforceps and weighed 5 pounds, 13¾ ounces. The mother's Wassermann reaction was positive.

(8) R. W. The fetal heart tones were present on admission. The patient had a total labor of 18 hours. The baby was delivered by low forceps and weighed 5 pounds, 11½ ounces. There was approximately 50 per cent premature separation of the placenta.

(9) R. O. The fetal heart tones were present on admission. The patient had a total labor of 27¾ hours. The baby was delivered spontaneously and weighed 5 pounds, 13½ ounces.

(10) J. J. The fetal heart tones were not heard on admission. The patient had a total labor of 9 hours. The baby was delivered spontaneously and weighed 5 pounds, 6 ounces.

Neonatal Death.—(1) A.C. A living baby which weighed 7 pounds, 11 ounces, was delivered with low forceps. The condition of the baby at the time of delivery was thought to be fair. After four and one-half hours, the temperature rose to 105° F. All attempts to lower the temperature failed and the baby died twelve hours after delivery.

MATERNAL MORTALITY

Seventy-three cases were managed by the treatment outlined. There were three maternal deaths in this series. Two of the patients who died had eclampsia and the other had severe preeclampsia.

Case 1.—G. S., a colored woman, gravida 1, para 0, 17 years of age, was admitted to the hospital because of pregnancy near term and in early active labor. On admission, she appeared to be drowsy, lethargic, and edematous even in her face. Her lower extremities re-

vealed 3 to 4 plus pitting edema. The blood pressure was 210/130. The urine contained 4 plus albumin. The patient had two generalized convulsions soon after admission and before the spinal anesthesia was started. She had fairly good response to spinal anesthesia. Her urine was grossly bloody on admission and only 102 cc. of urine was obtained during the first twelve hours that she received the continuous spinal anesthesia. She was delivered of a stillborn baby which weighed 5 pounds, 1½ ounces, 24 hours after admission. Before delivery, with administration of the spinal anesthesia and additional sedation with dilaudid® and magnesium sulphate intravenously, this patient continued to have generalized convulsions every 1 to 5 hours, having a total of fourteen convulsions after the spinal was started and up to the time of delivery. After delivery she appeared to improve and 30 cc. of clear urine was obtained. Two hours after delivery her pulse gradually became imperceptible, respirations were reduced to 5 per minute, and her blood pressure became unobtainable. She died two and one-half hours after delivery. Autopsy report: "(a) Focal liver necrosis, moderate, (b) cerebral edema, moderate, (c) sub-endocardial hemorrhage, left ventricle of heart, (d) nephrosis, acute, bilateral, and, (e) pulmonary congestion and edema with focal intra-alveolar hemorrhages and terminal bronchopneumonia. The changes in the kidneys, especially in the distal convoluted tubules and loops of Henle, are consistent with those of lower nephron nephrosis."

Case 2.—L. R., a colored woman, gravida 1, para 0, 21 years of age, was admitted to the hospital because of a 28 weeks pregnancy complicated by hypertension and edema. On admission there was marked edema about the face and eyes. The lower extremities revealed a 3 plus pitting edema. Blood pressure was systolic 200, diastolic 150. Urine contained 3 plus albumin. The abdomen was tense, but no contractions could be palpated. Fetal heart sounds could not be heard. A sterile vaginal examination revealed that the cervix was 1-2 cm. dilated, and the vertex of the fetal head presented at the level of the ischial spines. The membranes were protruding through the cervical os and were inadvertently ruptured. A continuous spinal anesthesia was begun and one hour after this she delivered spontaneously a stillborn fetus weighing 2 pounds and 9 ounces. The continuous spinal anesthesia was continued after delivery in an attempt to control her blood pressure and restore the urinary output. On the third postpartum day she had four generalized convulsions. On her fourth postpartum day she became comatose and remained in that condition until her death the same day. Her total urinary output was only 468 cc. during her four postpartum days. Autopsy was not permitted.

Case 3.—R. H., a colored woman, gravida 1, para 0, 37 years of age, was admitted to the hospital because of a term pregnancy and active labor complicated by hypertension, severe headache, and visual disturbance. This patient was attended by an outside physician who gave her five minims of pituitrin® about four hours before she was referred to the hospital. On admission to the hospital, she was irritable, disoriented, and complained of severe headaches. The uterus was firm and it did not relax. No fetal heart sounds were heard. Her blood pressure was systolic 210 and diastolic 120 and her pulse was 140 per minute. Her urine contained 4 plus albumin. A sterile vaginal examination revealed that the cervix was almost completely dilated with the vertex not engaged in the pelvis. Her pelvis was generally contracted and there was marked cephalo-pelvic disproportion. A continuous spinal anesthesia was started. The patient's respirations became irregular; however, there appeared to be no paralysis of the intercostal muscles. Oxygen was given by mask and thirty-five minutes after the last dose of metycaine® by spinal, the patient's respirations ceased entirely, and at this time her blood pressure immediately dropped from 230/120 to 60/50. Artificial respiration was given by positive pressure until her death eighteen hours after the spinal was given. Her pulse remained strong and around 88 per minute until a few minutes before death.

Autopsy report revealed: (a) massive intraventricular hemorrhage of the brain, (b) focal and perilobular hemorrhage and necrosis of liver, (c) thrombi (protein) of liver capillaries, (d) lower nephron nephrosis, (e) chronic pyelonephritis (mild), (f) generalized arteriosclerosis, (g) fatty infiltration and scarring of the myocardium.

CONTROL OF BLOOD PRESSURE

In most of our patients the blood pressure showed an immediate drop after the initial spinal injection. It rose gradually toward its former level, but was quickly lowered again by subsequent injections of metycaine.® When the patient was having uterine contractions, it was more difficult to control the level of the blood pressure because it varied considerably. After delivery, the blood pressure was more easily controlled and it remained more stabilized. *Table 5* shows the average blood pressure obtained at the time of admission and after the spinal anesthesia had been started. It also indicates the average time and amount of the drug required to control the cases in our series.

In the group of 35 severe preeclamptic patients treated, the highest individual admission blood pressure obtained was systolic 240 and diastolic 170 and the lowest was systolic 170 and diastolic 110. The average admission blood pressure for all of the preeclamptic cases was systolic 190 and diastolic 123 and the average blood pressure during treatment with continuous spinal anesthesia was systolic 155 and diastolic 100.

In the group of 38 eclamptic patients treated, the highest individual blood pressure obtained on admission was systolic 250 and diastolic 150 and the lowest was systolic 135 and diastolic 80. The average admission blood pressure for the entire series of eclamptic cases was systolic 180

and diastolic 115 and the average blood pressure during the treatment with spinal anesthesia was systolic 152 and diastolic 97.

The duration of the continuous spinal anesthesia varied from 1 to 145.5 hours. The amount of metycaine® administered varied from 30 to 2,602.5 milligrams.

CONTROL OF CONVULSIVE SEIZURES

As indicated in *Table 4*, the thirty-eight patients with eclampsia had a total of two hundred and fourteen convulsions prior to spinal therapy and a total of one hundred and eighteen convulsions after the treatment had been started. These results certainly do not indicate that the convulsize seizures were controlled by the use of spinal anesthesia. Thirty-eight patients had a total of 84 convulsions after the spinal anesthesia had been started and before delivery. The same patients had a total of 34 convulsions after delivery while the spinal anesthesia was still being administered. We cannot credit the spinal anesthesia alone with this reduction in the number of convulsions, because, after delivery in many of the cases, we used dilaudid® and nembutal® rather freely for sedation in addition to the spinal anesthesia.

Hingson said that of the 74 cases of eclampsia treated with conduction anesthesia nerve blocks, only two of his patients had any convulsions after the institution of an effective nerve block. Of our 38 cases, 22 of the patients had convulsions during the administration of the spinal anesthetic, but only ten of these had four or more convulsions.

IMPROVEMENT OF URINARY OUTPUT

The urinary output was restored to a normal level in every case except the 3 who died. In most patients it required approximately 24 hours to restore the urinary output to a normal level. In the patients who were not in labor, the urinary output returned to normal immediately after the continuous spinal anesthesia was started. In the majority of patients during labor, the urinary output was reduced even though the spinal anesthesia was being administered. We restrict the oral administration of fluids in patients in active labor and this naturally decreases urinary output even in normal patients. In every case, except the three that died, the urinary output was restored to normal within 12 to 24 hours after delivery. The 3 patients who died were the only patients with anuria or severe oliguria during the administration of the spinal anesthesia. L. R. had a urinary output of only 468 cc. in four days, G. S. had 182 cc. during the 24 hours preceding death, and the third, R. H., had complete anuria when she was admitted to the hospital.

As indicated by Turner and Houck[3] the return of urinary output to a normal level may well be purely coincidental to the spontaneous reestablishment of urine flow.

PULMONARY EDEMA

Clinically this complication did not occur; however, at autopsy of G. S. the lungs revealed

"pulmonary congestion and edema with focal intra-alveolar hemorrhages, and terminal bronchopneumonia."

We think that the absence of clinical pulmonary edema in the cases studied was due to early digitalization and the effect of the spinal anesthesia creating a "bloodless phlebotomy." This lessens the load on a heart that is greatly overtaxed, by pooling blood in the splanchnics and the lower extremities.

LABOR AND DELIVERIES

The presence of the continuous spinal anesthesia gave an ideal analgesia during labor. The patients seldom knew they were having uterine contractions. The anesthesia did not seem to retard the progress of labor.

Most of the deliveries were completed under the spinal anesthesia. In a few of the abdominal deliveries, an additional injection of procaine solution 3-4 per cent was given through the same spinal catheter.

With rare exception each patient on admission was given dilaudid® 1/20 grain hypodermically. After the spinal anesthesia had been started, approximately half of the patients were given an additional injection of dilaudid® 1/32 grain before delivery when she (the patient) became restless. Usually nembutal® grains 1½ to 3 were given before delivery to combat any toxic effect of the metycaine®.

After delivery, we do not hesitate to use dilaudid® freely if the urinary output is normal. We usually give some sedation every four hours, frequently alternating between dilaudid® 1/32 grain and nembutal® 1½ grains. As soon as the patient is quiet and well controlled, the sedation consists of only phenobarbital grain 1, four times daily.

Complications.—There were no serious complications incident to the use of spinal anesthesia. In the case of J. M., an eclamptic patient, the injection of 0.5 cc. of 1.5 per cent metycaine® reduced the blood pressure from around 250/150 to a shock level of 60/40. The 1.5 per cent metycaine® was diluted with equal portions of sterile Ringer's solution, and the blood pressure was adequately controlled with 0.1 to 0.5 cc. of this 0.75 per cent solution. This same patient developed a postpartum psychosis and she became so violent that it was necessary to commit her to a mental institution on her twelfth hospital day. Another eclamptic patient, B. J., developed a postpartum psychosis on her sixth hospital day. She was also committed to the state mental hospital.

One of the severe preeclamptic patients, O. B., had a severe postpartum hemorrhage after the delivery of twins. E. M., an eclamptic patient also had a severe postpartum hemorrhage. The bleeding was controlled in each case by packing the uterine cavity with gauze. Both patients were transfused with whole blood.

The majority of our eclamptic patients in this series had an elevation of temperature, usually around 101 to 102° F. from one to three days postpartum. In a few cases, the cause was attributed to pyelitis.

One of the eclamptic patients, W. W., began having hallucinations on the first postpartum day. This cleared up within a few days.

One of the eclamptic patients, B. M., apparently aspirated some vomitus during a generalized convulsion on her second postoperative day. A chest x-ray was compatible with a pneumonia process. Her temperature remained elevated from 100 to 101° F. until her eleventh postoperative day.

An eclamptic patient, E. J., upon whom a cesarean section was performed, had a disruption of her operative wound. This required a prolonged hospital stay. She was discharged on her twenty-seventh hospital day.

Table 6 shows the incidence of types of delivery and fetal results. There were four multiple (twin) pregnancies in this series. The indications for cesarean section are given in *Table 8*.

SUMMARY AND CONCLUSIONS

(1) Seventy-three cases of severe preeclampsia and eclampsia treated with continuous spinal anesthesia have been presented. Thirty-eight of the patients had convulsive seizures.

(2) There were three maternal deaths in this series, giving a gross maternal mortality of 4.1 per cent for the entire group of cases or 5.3 per cent for the 38 eclamptic patients.

(3) One patient died undelivered. Two patients were admitted to the hospitals postpartum. Seventy patients were delivered in the hospitals of a total of 74 babies. Four patients had twin pregnancies.

(4) Eleven babies were stillborn and one died twelve hours after delivery. The gross fetal mortality rate was 16.2 per cent and the corrected fetal mortality rate was 7.4 per cent. This corrected rate was obtained by eliminating four babies that died *in utero* before admission to the hospital, one baby whose heart rate was below 50 per minute before admission, and 2 babies too small to survive.

(5) After the first injection of the continuous spinal anesthetic, there was an immediate drop in blood pressure in most of the patients. The blood pressure level was usually controlled by the amount and frequency of the injection of the anesthetic agent.

(6) In this group of patients the convulsive seizures might have been more quickly controlled by the injection of a larger dose of metycaine®.

(7) Continuous spinal anesthesia seems to quiet the patients quickly and it appears to aid the rapidity with which patients regain consciousness and become cooperative.

(8) The urinary output was restored to a normal level within 12 to 24 hours in every case except the 3 that died.

(9) Clinically pulmonary edema did not occur in this series of cases.

(10) The presence of the continuous spinal anesthesia gave an ideal analgesia during labor. Adequate anesthesia for the vaginal and most

INDICATIONS FOR CESAREAN SECTION

Toxemia controlled but unable to induce labor	10
Previous cesarean section	1
Primary uterine inertia	3
Cephalopelvic disproportion	3
Fibroids obstructing birth canal	1
Premature separation of placenta	1
	19

TABLE 8

of the abdominal deliveries was obtained. We feel that continuous spinal anesthesia will decrease the fetal mortality because fetal anoxia caused by heavy sedation is not encountered.

(11) No serious complications incident to the use of spinal anesthesia were encountered in this series of 73 cases.

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DISCUSSION (*Abstract*)

Dr. William N. Thornton, Jr., Charlottesville, Va.—Dr. Ware and his group have emphasized the value of prenatal care. Only three of his 73 patients with severe toxemia and eclampsia had adequate prenatal care. We should exert more effort to see that every pregnant woman has adequate prenatal care. Until we do this, we shall be faced with the problem of treating severe toxemia and eclampsia.

It is difficult to evaluate conduction anesthesia in the treatment of toxemia of pregnancy when it is used in conjunction with other time-proven methods of therapy. Our theory of treatment differs a little from Dr. Ware's, and I believe our problems are very much the same since we reside in neighboring cities.

We do not use conduction anesthesia. Fluid intake is governed by measured urinary output, and we do not routinely digitalize each patient. Digitalization is done upon development of signs of impending cardiac decompensation. Accordingly, conduction anesthesia is the only fundamental difference in the two types of therapy. We have treated 60 consecutive eclamptics without a maternal death. The next 60 eclamptics may show entirely different results.

I have not figures on fetal mortality in our series. I am impressed with the low fetal mortality in his group of treated patients, and believe that conduction anesthesia has some distinct advantage over heavy sedation as customarily used.

I think Dr. Ware is correct in emphasizing that this is an experimental study, and that conduction anesthesia should not be used unless one has a proper staff, and particularly a good anesthesiologist. It would be a mistake to carry out this therapy unless the hospital was properly equipped for such a technic. We have been afraid of this form of anesthesia in toxemia of pregnancy for one particular reason: we have noted marked and profound drops in blood pressure after spinal anesthesia, and hesitate to use it in toxemic patients.

Dr. Henry J. Ringo, St. Louis, Mo.—Not much literature is available on this subject, and about the only reference on this work are those contributed by the authors of this paper and by Drs. Hingson and Edwards. I have not used continuous spinals in the treatment of this condition and am most hesitant to do so. I agree that spinal anesthesia should be administered only by a well trained anesthetist and in a well regulated hospital.

According to Dr. J. P. Greenhill, spinal anesthesia is the most dangerous of all forms of anesthesia for a pregnant woman. However, in the treatment of such a serious complication arising during pregnancy, labor and the early post-partum period, we may be justified in using a procedure which might be detrimental to the normal pregnant woman. I shall remind you of a few statistics on the use of spinal anesthesia.

In almost a million surgical cases which Hanson collected and in which all forms of general, local and spinal anesthesia were used, the highest death rate was that following spinal anesthesia. Franken collected 2,088 cases of cesarean section performed under spinal anesthesia and found that there was one death for every 139 patients, which was attributed to the spinal, and in comparing operations upon the pregnant woman with operations on the non-pregnant woman, he found the death rate was 26 times higher in the pregnant woman.

Then, of course, we have injuries to the spinal cord which are sometimes inevitable. Particularly when a ureteral catheter is inserted into the spinal cord and left for as long a period of time as six days, which Dr. Jones says is the maximum duration of his treatment.

Thorsen of Sweden, who reviewed 2,500 cases in which spinal anesthesia had been used, said that neurological complications arising from spinal occur in such frequency, to such an extent, and with such an intensity and duration of the symptoms, that it should not be adopted unless no other form is advisable.

However, in the face of all these statistics and disagreeable complications, we cannot condemn the use of spinal anesthesia when we are treating a condition as severe as eclampsia. I feel that this method of treatment should not be used on patients showing a moderately advanced toxemia of pregnancy which can best be handled by other hospital procedures, and labor terminated if advisable by the various methods of choice. It should be resorted to only in patients who have had little or no prenatal care and who are brought to us in a serious state, where it is possibly advisable to get them into condition to stand delivery from below or cesarean section, whichever our choice may be.

Spinal anesthesia produces effects similar to those of a sympathectomy. It relieves the spastic contraction of the blood vessels in the lower abdomen and lower extremities, thereby admitting more blood to these parts which lowers the blood pressure. Since more blood flows through the kidneys, more urine and toxins are excreted. This, consequently, means improvement of the patient.

In closing, I wish to point out one of the many interesting facts shown by this paper; that is the fact that 48 per cent of the eclamptics were young women under 20 years of age. All I can say to this is, why?

Dr. Stanley T. Garber, Cincinnati, Ohio.—Today no group is relying on one form of treatment alone for preeclampsia and eclampsia. Prevention by better prenatal care and particularly high protein and low sodium intake, is most important. However, we still encounter severe preeclampsia and eclampsia on occasion, usually in neglected patients.

In most places sedatives are used, including magnesium sulfate. Fluids are restricted or forced, we prefer an

ample intake of 3,000 to 5,000 cc. per day, and use 5 per cent glucose in water, feeling that water is a most effective diuretic agent.

The authors have used spinal anesthesia to reduce blood pressure. Experimentally we have used spinal anesthesia at the Cincinnati General Hospital. We find that it does lower the blood pressure somewhat, but not too effectively. The physiology of the circulation is not improved, but further impaired by its use. The chief action is venous pooling in the lower extremities, diminished circulating blood volume, diminished venous return, reduced cardiac output and reduced renal blood flow. In other words, it acts like a bloodless phlebotomy.

Spinal anesthesia for the treatment of preeclampsia and eclampsia is not safe in the hands of most physicians. It is difficult to determine the level in comatose patients. Its use is of necessity restricted to a relatively short period of time in days. Its effect is not predictable or uniform. Finally, there are other drugs, the veratrum alkaloids, which more safely and effectively relieve the abnormal arteriolar vasoconstriction without embarrassing the circulation, which at the same time secondarily bring about a lowering of the blood pressure.

Dr. William M. Howdon, Miami, Fla.—Just as we disagree upon the administration of 4,000 to 6,000 cc. of fluid a day in the treatment of the eclamptic, anything that is as unphysiological as continuous spinal anesthesia should not be used routinely in the treatment of a patient already having a great deal of difficulty in compensating for her disease process.

We have spent considerable time studying the blood pressure. While not reflexly raised, it is in a way compensatory. I shall not go into the real cause of hypertension; however, certain changes that occur under spinal anesthesia have led us to believe that it is a humoral substance and does not result from spasm or reflex, because we definitely have not been able to relieve the spasm in the renal arteries or to increase urinary output by the use of continuous spinal or caudal anesthesia. Unfortunately, the reverse has been true, and if one does not maintain normal hydrostatic pressure to the kidney, there will be diminished filtration. The work of Turner and co-workers in Memphis brings out all the faults of continuous spinal anesthesia. The patients are suffering from shock (hematogenic) and trying their best to compensate, and the blood pressure by itself is not responsible for convulsions. The degree of anoxia, as a result of cerebral edema, is responsible, the polarity of the cells is upset, and convulsions ensue. Many patients have become convulsed with systolic pressures of 120 mm. of mercury. The lowering of the blood pressure alone, as the essayist said, does not diminish convulsions materially.

We think that continuous spinal anesthesia does have a definite place in the treatment of several obstetrical complications. Over-diligence in treatment producing a reversal of the picture (an increase in circulating blood volume and vascular overload) will usually be avoided by frequent observation for edema in the basal lung fields. Usually, the first sign we notice is an increase in the pulmonic second heart sound. The patient who has impending congestive failure will be helped immeasurably by continuous spinal. This is also true of the patient with lower nephronephrosis. Last but not least, is a mounting blood pressure in the face of conservative treatment; continuous spinal here will often prevent intracranial hemorrhage. The anesthesia should be limited to those areas below the level of kidney innervation.

Once there is a restoration of the blood volume and normal hemodilution has occurred, if diuresis does not occur, a diagnosis of lower nephronephrosis is made.

We do not agree that sodium lactate or bicarbonate is necessary in the treatment of the eclamptic except where there is severe adrenal insufficiency demonstrated by the usual tests and findings. It is rare to find any significant lowering of the total serum chlorides. The acidosis is primarily caused by dehydration, and if one corrects the dehydration, the acidosis will be automatically corrected. To correct the dehydration, it is preferable to raise the colloidal osmotic pressure by administering blood plasma and proteins. Then, one will clear the extra-cellular or interstitial spaces of edema, and this is more physiological than giving water, regardless of the concentration of sodium or glucose.

I want to compliment the essayist on his results in fetal salvage. Our fetal mortality we have not been able to reduce below 18 per cent. Our maternal mortality to this day for this year is zero.

If you feel that you should use continuous spinal, please skin test and conjunctiva test these individuals because, occasionally, you will find a patient sensitive to metycaine®, procaine, or any agent selected, and at times the reaction may be alarming. A patient of ours received 5 cc. of 1.5 per cent metycaine® over a period of 1 hour and 45 minutes in 1 cc. dosage. We know that this individual should not have received this medication because of the extreme labile reaction of the blood pressure to small amounts of the anesthetic agent, the prompt droppage of the blood pressure to shock levels, followed by its slow compensatory return in an effort to re-establish circulation. The anesthetic agent should have been discontinued with the first dose of medication as this reaction shows an extreme sensitivity. From a blood pressure of 200/110 mm. of mercury, with 1 cc. of metycaine®, there was an immediate drop of the blood pressure to a shock level followed by a gradual return to practically the previous level. This reaction occurred four distinct times. With the fifth injection, the blood pressure did not return and the patient expired. It is a situation such as this that I would have you guard against.

Dr. Ware (closing).—We have reported a small group of patients with a high incidence of severe preeclampsia and eclampsia. Continuous spinal anesthesia by the catheter technic was used in a group of patients with severe preeclampsia with the hope of preventing convulsive seizures. We used the continuous spinal anesthesia for the preeclamptic patients who failed to respond to the usual conservative treatment.

The eclamptic patients treated with continuous spinal anesthesia in this report were usually very ill patients. Ninety per cent of the eclamptic patients were in the severe group by Edens classification. Even with this type of patient our maternal mortality was only 5.2 per cent for the patients with convulsive seizures, and the infant mortality was 16.2 per cent.

Eclampsia occurring after a rapid onset of toxemia in a young patient sixteen or seventeen years old is a different problem from eclampsia occurring in a patient thirty-five years or older, with a long standing hypertension, but we have been successful in treating both types with continuous spinal anesthesia.

We consider the patient's blood pressure as a symptom of her disease and not the cause of the toxemia or convulsive seizures.

Three patients with anuria before the continuous spinal was started failed to overcome the anuria. We think this was due to the fact that the patients had suffered irreparable damage before the continuous spinal was started. In many other patients anuria was quickly corrected after the continuous spinal anesthesia was started.

We consider our work with continuous spinal anesthesia as experimental. We hope to continue until we have treated at least two hundred eclamptic patients by this method. The present plan is an improvement over the treatments we have used in the past, and we hope that experience with a larger number of patients will reduce both our maternal and fetal mortality. We do not recommend this method for use by the physician who has had little experience with continuous spinal anesthesia. Wo do recommend rapid digitalization of all eclamptic patients and the free use of oxygen even if continuous spinal anesthesia is used.

In conclusion I should like to emphasize the fact that the prevention of eclampsia is still the best treatment. We can reduce the incidence of the toxemias of pregnancy, particularly eclampsia, by educating women to seek prenatal care early and consistently. As physicians we must all realize that increasing blood pressure, and rapid gain in weight, as well as changes in the patient's urine, often give evidence of the onset of toxemia.

Dr. Jones (*closing*).—We consider the use of continuous spinal anesthesia in the treatment of eclampsia and severe preeclampsia as in the experimental stage. At the Medical College of Virginia, a continuous spinal anesthetic, used as indicated in our discussion, is never given unless the resident is present and one of the resident staff members remains with the patient until the anesthetic is discontinued.

As mentioned in one of our cases, a profound drop in blood pressure was obtained. Some patients are probably very sensitive to the drug. We think that it is extremely important that small amounts of the drug be used, diluted if necessary, and the patient be watched very carefully for a drop in blood pressure, signs of shock or respiratory difficulty.

As far as we know, there have been no spinal cord complications in any of our patients. Before discharge from the hospital, the patients were allowed out of bed and walked about the ward. Most of these patients have been checked in our outpatient department after being discharged from the hospital and several of them have returned for another delivery.

In the thirty-eight cases of eclampsia, sixteen were single girls and the oldest of the single girls was twenty-three years of age. Of these thirty-eight cases, 63 per cent were twenty years of age or under.

PATHOLOGIC CONDITIONS TREATED BY PROCTOLOGISTS*

By JULIUS E. LINN, M.D.
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This paper is a review of the pathological findings following proctological surgery on 1,061 patients over a three-year period at the Birmingham Baptist Hospital. Dr. Albert E. Casey, Chief of the Department of Pathology, examined grossly and microscopically all tissue removed.

Forty-six per cent of these patients were operated upon by four local proctologists and 44 per cent were operated upon by fifteen general surgeons (with fifty or more anal operations per year). Ten per cent were operated upon by forty-one physicians (with less than five anal operations per year, average two). Twenty per cent showed minimal or no histopathology but to this I must say that there is little or no tissue to be examined in relieving a patient of anal stenosis, *fissure in ano*, anal cryptitis or abscess. Eighty per cent of the total showed moderate to marked histopathological changes while eighty-seven per cent of those operated upon by the four proctologists and fifteen general surgeons showed moderate to marked histopathological changes.

Following are findings among the 1,061 patients. Thirty-seven per cent showed moderate varices of external and middle hemorrhoidal veins and thirty-four per cent showed marked varices of external and middle hemorrhoidal veins. Fourteen per cent showed moderate to marked inflammation. Twenty-one per cent showed phlebothrombosis of external hemorrhoidal veins. Five per cent showed scarring or stenosis of anus. Six per cent showed ulceration, six per cent showed sinus or fistula. Abscesses, foreign body reaction, infarction, acute inflammation without infarction, subacute inflammation, endoarteritis, eosinophilia, obstruction of sweat gland ducts and cavernous lymphangiectasis ranged from 1.6 to 0.1 per cent of the total.

Specific conditions diagnosed by routine pathological examination (prior diagnosis of malignancy excluded) in the 1,061 patients were:

*Chairman's Address, Section on Proctology, Southern Medical Association, Forty-Fifth Annual Meeting, Dallas, Texas, November 5-8, 1951.

(1) *Malignant Neoplasms.*—There were three cases of adenocarcinoma (rectal mucosa), five squamous carcinoma of the anus, three precancerous changes, and one malignant mesenchymal tumor in the recto-vaginal septum, all of which may have gone undiagnosed and been improperly treated had it not been for the routine microscopical study of all tissues removed.

(2) *Benign Neoplasms and Hyperplasias.*—Four cases showed squamous metaplasia, ten squamous hyperplasia and downgrowth, ten squamous polyps, fifteen squamous inclusion cysts, twenty-two squamous papilloma, virus type, anus (rectal surface), one teratoma of the ovary in the rectum and one lymphoma of the rectum.

(3) *Specific Infections.*—A case of tuberculosis was diagnosed from study of tissue from an anal ulcer; also one case of trichinosis.

Time will not permit discussion of all the conditions mentioned above but I should like to give you a report upon three of the more interesting cases.

Case 1.—Mrs. J. L. C., a white woman, age 40, had seven children ranging in age from 6 to 23 years of age. She came to see me January 6, 1947 complaining of pain in the lower abdomen and pelvis. The pain had been fairly continuous and gradually growing more severe with a sensation of fullness and pressure in the rectum for the previous two years. There was no history of blood from rectum. She had had only the usual childhood diseases, no injuries or previous operations. This patient's general physical examination, blood studies and urinalysis were all in the normal limits except the following:

On recto-vaginal examination a round firm mass was located in the recto-vaginal septum, more prominent from the rectal side. It was palpated at about six cm. above the anal margin, and was tender to pressure. It was attached to the rectal wall. The proctoscope was passed to 20 cm. revealing the above described mass between 6 and 12 cm. on the anterior rectal wall which was covered by mucosa; no surface ulceration was noted. After thorough preparation of the colon with sulfasuxidine®, antibiotics, and enema, the following operation was done on January 17, 1947.

The anus was widely dilated and the mass was visualized. The mucous membrane of the rectum covering the mass was grasped with Allis forceps and pulled downward. Another Allis was then put above the mass and it was delivered through the anus. The mucous membrane was incised exposing the mass. As this was done the mass ruptured and the entire contents were removed leaving only the thick fibrinous capsule. This was carefully dissected out with scissor dissection from surrounding structures. The bleeders were all ligated with plain No. 00 catgut. The cavity from which the mass was removed was closed with No. 00 plain catgut and the mucous membrane of the rectum was closed with No. 00 intestinal chromic suture. A zepheran® gauze pack was left in the rectum.

Pathological Report.—The specimen is a mass from between the rectum and vagina. It consists of an irregularly shaped strip of tissue which measures 5 x 2.5 cm. in its greatest width, and varies in color from a rather yellowish gray to a pinkish gray. It seems to be comprised grossly of a small amount of fat, muscle tissue and a membranous type of structure. Also received are several fragments of faintly yellowish amber colored material. This when heaped together forms a mass 2.5 x 2 cm. which grossly appears to be adipose tissue.

The microscopic sections show the wall of the cyst, which is made up of dense, bundles of smooth muscle, separated by coarse scar tissue masses and showing some scattered, perivascular lymphocytic infiltration. The lining of the structure is composed of a loose tissue, containing numerous spindle shaped cells of variable sizes and shapes. They are intensely hyperchromic, but after long searching, no mitosis could be demonstrated. The nuclei of these cells are often large, vascular and contain prominent nuclei. There is a gradual blending with the embedding tissue of the wall and there is no distinct capsular surface. An ample margin about the cyst is present, ranging from 4 to 5-6 mm. in depth. Another section of the cyst wall shows similar structure but in the lining there is a much more cellular hyperchromic tissue like that above described. There is some variation in the size of the cells again but no mitosis could be seen. Sections of the content of the cyst show a loose myxomatous tissue with scattered, irregular spaces separately filled with a thin basic staining to eosinophilic coagulum. The cells of this material are shaped with branching processes. They are supported in a myxomatous type of tissue. The nuclei are large. There is considerable variation in size of cells but again after long searching, no mitosis could be demonstrated.

The diagnosis is malignant mesenchymal tumor.

It is apparent from the gross appearances of the material that the tumor was completely removed with a wide margin. The structure of the tumor is suggestive of the structure of the umbilical cord. It is distinctly myxomatous. There is considerable variation in size of cells but after long searching no mitosis could be demonstrated. It is believed that this tumor is of a low grade malignancy but the patient should be closely followed.

From the date of operation, January 7, 1947 through August 1951 the time of last examination, there has been no evidence of recurrence.

Histologists describe the presence in the connective tissues of the adult body of undifferentiated mesenchymal cells. These presumably have the potencies of embryonic mesenchymal cells and may be capable of differentiating into any of the adult tissues derived from mesenchyme.

"In no other group of tissues is metaplasia so frequent or so important for the pathologist as in the derivatives of the mesenchyme: fibrous, mucoid, adipose, synovial, meningeal, cartilagenous, osseous, hemopoietic, vascular and reticulo-endothelial tissues."

It is pointed out by Willis[1] in his pathology of tumors that "innocence" and "malignancy" are not distinct properties of tumors but are merely terms of prognostic convenience. This is particularly pertinent with mesenchymal tumors.

Each tumor must be judged on its own merits: on its rate of growth, its cellular structure, and its powers of infiltration or metastasis. While there are of course many mesenchymal tumors the malignancy of which is plain from their microscopic structure, there are also many others for the prognosis of which great histopathological experience is necessary and even then mistakes will be made.

Considering the abundance of mesenchymal tissue in the body and its ready proliferative response to injury, mesenchymal tumors are surprisingly infrequent. The fact alone is significant as regards the supposed traumatic and irritation causation of tumors. This leads me to believe that trauma from childbirth may have had something to do with the case I have reported, since the patient had had seven children, although reparative and chronic inflammatory changes are an everyday occurence. Mesenchymal neoplasia is rare, which prompted me to present this case. "Of great interest is a report by Gilmour of a recurrent tumor in an adult which consisted of mucinous tissue like embryonic mesenchyme with also lipoblasts and hemopoietic cells and for which therefore the suggested name 'mesenchymoma' is appropriated."—Willis.

Case 2 (*Teratoma of the ovary in the rectum*).—A case of Mrs. E. C. Mc., a white woman, age 63, was admitted to the Baptist Hospital for treatment of a detached retina. On routine physical examination by her family doctor a mass was encountered on the anterior rectal wall, between 10 and 14 cm. from the anal outlet. I saw this patient in consultation for proctoscopic examination and was advised to obtain a specimen for microscopic study as malignancy was suspected. The proctoscope was passed to 10 cm. where a white globular, glistening mass with multiple strands of hair about 6 cm. long was visualized. This mass was not covered with mucosa and its relation to the rectum was similar to that of a sessile polyp. I did not do a biopsy as I felt it would drain the cyst but advised that in my opinion it was a dermoid cyst of an ovary and should be excised.

The preoperative diagnosis was teratoma or dermoid of the recto-vaginal septum penetrating into the rectum.

The postoperative diagnosis was teratoma or dermoid of the left ovary. Operation consisted of coccygectomy.

Excision of the teratoma of the ovary was performed by the patient's family surgeon.

Under spinal anesthesia, an incision was made over the coccyx and the coccyx was disarticulated from the sacrum. The levator ani muscles were exposed and incised along the line of their fibers. The rectum was exposed by pushing away adjacent fat. The rectum was then incised longitudinally. The tumor was seen easily through the incision in the rectum covered by rectal mucosa. Hair was seen growing from the surface of the tumor and one tooth was protruding from the tumor. The tumor itself was about 1 cm. in diameter and was irregular. The base of the tumor was cut across and it was felt that a small piece of tissue possibly 1 cm. in diameter was present outside of the wall of the rectum. The rectal wall was incised along this stump and the peritoneal cavity was entered. The small piece of tissue outside the rectum proved to be ovary which evidently was the site of origin of the teratoma. It is to be noted that a small portion of ovary was intra-rectal and the entire tumor was within the rectum. The opening on the anterior surface of the rectum from which the tumor was removed was closed carefully with fine catgut. The incision in the posterior surface of the rectum was likewise closed transversely in layers with catgut. The levator ani muscles were approximated and the fascial layers over the rectum likewise were reapproximated. A drain was left on each side of the rectum and brought out the center of the wound. The skin was closed with silk.

Pathology Report.—A nodule, which is composed of two portions, was received. The main portion is somewhat rounded and measures 3.1 cm. in diameter and 2 cm. in thickness. It is pinkish white with some hair growing on the surface. On one side of the main mass is found a piece of bony tissue, apparently a tooth, which is greenish black, measuring 1.7 cm. in length, 0.7 cm. in width and 0.06 cm. in thickness. At a distance of 4 cm. from the tooth on the same side is a polyp-like structure measuring 1 x 0.6 x 0.3 cm. It is smooth on the surface and is attached to the mass by a stalk measuring 2 mm. in diameter and 2 mm. in length. Cut section of the main mass shows the presence of adipose tissue and some whitish, fibrous tissue, but no other bony structure or cartilaginous structure is found. Attached to one pole of the mass is another nodule, which measures 1.5 cm. in diameter and 1.2 cm. in thickness. It has a similar kind of pinkish covering and some hair is also present on the surface. On cut section it is firm and pinkish white and homogeneous. At a distance of 1.1 cm. from the second nodule is what appears to be the stalk of the main mass which measures 1.1 cm. in diameter and 0.4 cm. in length. Cut section of the stalk shows nothing abnormal. Another nodular piece of pinkish yellow tissue measures 2 x 1.2 x 1.0 cm. It has a surgical surface. On cut section it is pinkish yellow and lobulated.

Microscopic examination disclosed stratified squamous epithelium. Ciliated columnar epithelium, a piece of ovarian stroma, adipose tissue, dermis with sebaceous glands and hair follicles all were identified microscopically. Nothing suggesting mucosa of the large bowel was seen.

The diagnosis was teratoma with predominance of dermoid elements, of ovary.

This is a solid type of teratoma, apparently in the ovary. The structures are mature, suggesting a benign nature.

Adult teratoma comprises between 10 and 20 per cent of all ovarian new growths and appears at all ages, most frequently in the decade from twenty to thirty. The dermoid cyst, the most common form of the adult teratoma, visually appears as a unilateral, though occasionally bilateral, cystic, smooth walled tumor, dull in appearance. It may retain the shape of an ovary or be globular or egg shaped. The tumor may rupture into the peritoneal cavity, bladder or rectum. Intracystic plugs arise from the cyst wall in every instance. They may appear as small warty projections protruding slightly into the cavity but more often they appear as nipple-like projections covered by white opaque hairy skin. The plugs may occasionally show complicated structure and reproduce a complete body part, much as an atrophic head, a maxilla with teeth, a foot or limb. In the same manner a cyst arising from the bowel or from mullerian tissue found in the embryonic area may give rise to a pseudomucinous cyst that practically replaces the whole tumor. The contents of the cyst consist of sebaceous material, desquamated stratum corneum, sweat gland secretions, hair and teeth. The adult teratoma may show diverse symptoms and signs and follow quite a varied clinical course. Small tumors may be silent throughout life and large dermoid cysts may cause only local signs and symptoms. Peculiar signs and symptoms due to secondary changes in the tumor are often present and may result in a destructive and occasionally severe clinical course. Rupture of sterile or infected cyst contents into the peritoneal cavity has often been reported to produce fatal peritonitis. Also the rupture of a dermoid cyst into the bladder may be followed by urinary infection.

The epidermis of the adult teratoma is the tissue that most frequently shows malignant changes. Carcinoma of the epidermis is the most frequent type of malignancy. This carcinoma shows a very high degree of malignancy, with early and almost always fatal recurrence. Invasion from a tumor seated in a neighboring organ is rare and a true metastatic malignant tumor in an adult teratoma is exceptional; only one such case has been published to my knowledge. The treatment of adult teratoma is surgical. The frequent occurrence of secondary changes followed by dangerous complications and the possibility of malignant changes make a timely intervention imperative.

Case 3.—J. A. C., a white girl, age 12, complained of moderate rectal bleeding, bright red, during and following stools, of four weeks duration. There had been a moderate amount of pain in the rectum with stool for several weeks, along with mild abdominal cramping. She had suffered with constipation and had used laxatives and enemas frequently for two or three years.

Rectal examination revealed an ovoid submucosal tumor mass in the left anterolateral rectal wall about 3 cm. above the dentate line. The mass was movable but attached by a broad base. The mucosal color was normal and there was no ulceration. The mass measured approximately 2-3 cm. in length and protruded 1 to 1.5 cm. into the canal. There were 3 firm nodules approximately ¼ cm. in diameter just above the larger mass.

The proctoscope was passed 22 cm. No other pathologic condition was noted to this point.

Double contrast and air x-ray studies of the colon were reported negative. Bone marrow studies by the hematological department were reported normal. The red blood count was 4,380,000; white count was 8,100; and the differential showed 28 lymphocytes, 9 myelocytes, 60 segmented forms, 2 eosinophils and 1 basophil. Our clinical diagnosis was adenoma of the rectum and on January 4, 1950 under general anesthesia the growth and nodules were excised and sent to the laboratory for microscopical study.

Dr. Roger Baker gave the following pathological report: A rounded piece of tissue has a diameter of 2 cm. One surface is flat and covered by irregular gray to pink fibrous tissue. The rounded ulcerated portion is covered with mucosa and extends upward for a distance a full centimeter. The mucosa is yellow to pink except for one point near the margin which is red and rather glandular. All of it is glistening. There is severe and extensive lymphocytic infiltration with some tendency to formation of nodules. This occurs in the submucosa and to a lesser extent in the mucosa. There is a loss of the muscularis mucosae. This lesion corresponds to those described as being lymphoma of rectum by E. L. Heller and H. H. Lewis[2] in the *American Journal of Pathology*, May 1950.

The impression is lymphoma of rectum.

This is another case where great histo-pathological knowledge and experience are necessary for proper treatment. Heller and Lewis pointed out that the importance of the lesion lies in the recognition of its benign characteristics in spite of the histological features simulating malignancy. It is pointed out in the literature and true in this case that in none of these cases reported has there been evidence of disease elsewhere in the lymphatic tissus. In this case intramural nodulation was present with some induration, which suggested malignancy. Cases similar to this have been treated by irradiation or surgical resection of the rectum under the mistaken belief that the lesion was malignant. Lymphomas vary from a few millimeters to 8 to 10 cm. in diameter.

This child has been followed closely by proctoscopic and digital examination for a period of 20 months and there has been no evidence of recurrence.

SUMMARY AND CONCLUSIONS

Careful gross and microscopic histopathologic examinations of tissues removed are routine in the Department of Pathology for all patients subjected to proctologic surgery at the Birmingham Baptist Hospital. An analysis of routine examinations on 1,061 such patients over a three-year period revealed 12 undiagnosed malignant, 63 benign neoplastic anal viral conditions, and 2 specific infectious diseases (tuberculosis and trichinosis).

Of the 1,061 patients 46 per cent were operated upon by 4 proctologists, 44 per cent by 15 general surgeons and 10 per cent by 41 other physicians. In 20 per cent of the patients no anal pathology was found by histologic examination but many of these specimens were anal tabs removed by gynecologists during the course of other operations. Seventy-one per cent of the patients had moderate to marked varices of the external or middle hemorrhoidal veins; 21 per cent had thrombosis of the veins; 14 per cent had moderate to marked inflammation; 14 per cent had a sinus abscess or deep ulcer. Three case reports have been presented: (1) a teratoma of ovary with invasion of rectum; (2) a malignant mesenchymal tumor of retroperitoneal tissues which had invaded the rectum; (3) a benign lymphoma of the rectum.

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PRESENT DAY METHODS OF TREATMENT OF CARCINOMA OF THE CERVIX*

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It is a pleasure to be here today to discuss with you some of the problems regarding the therapy of carcinoma of the cervix. This is particularly true because carcinoma of the cervix remains one of the common neoplasms which affect women, and it is at the same time a disease which is amenable to proper treatment if it is found in its relatively early stages. I shall not go into the general problem of the symptomatology and diagnosis of this condition except to emphasize that in my opinion every radiologist should make a pelvic examination of the patients whom he treats. This is true whether he gives only external radiation for a gynecologic confrere who is to place the radium, whether he uses transvaginal radiation or whether he himself places the radium. I should also like to take this opportunity of emphasizing a point which I think at times needs repetition and that is, that to treat a patient for assumed menopausal bleeding without a pelvic examination including a biopsy and a dilatation and curettage when indicated is certainly to be frowned upon. I think it is equally poor judgment to irradiate for carcinoma a patient who is sent to you without proof.

Since most of us here today are radiologists and therefore probably favor radiation as the treatment of choice for cervical carcinoma, it is pertinent to recall that the first method of attack for this condition was necessarily surgical. Wertheim, at about the turn of the century, perfected his radical operation, although others had previously been using surgery. With the introduction of the use of radium and later of roentgen rays, it became evident that surgery had a real competitor in the treatment of this disease. It also became evident that irradiation was one of the mainstays in the treatment. Many of us have assumed that until very recently there has been relatively little activity in the field of surgical treatment of cervical carcinoma except perhaps by men of little discernment. All of us have seen patients who have been ill-advisedly operated upon for this condition by such surgeons. But the good journals have published more than 40 articles since 1935 by reputable men, advocating the use of surgery in carefully selected cases of carcinoma of the cervix. It behooves us, therefore, as physicians to take a broad and careful look at the whole subject of treatment of this disease and to make sure that we are not denying to our patients the best treatment that can be had, and for this we must have open minds. This thought was well expressed by Keene in discussing the paper of Shaw[1] on the relative value of radical surgery versus radiation for this condition:

"This presentation by one of England's most distinguished gynecologists contains a message of greater import than the recital of a personal experience in the

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treatment of cancer of the cervix. It exemplifies a state of mind which must prevail in our efforts to combat the disease."

This paper of Shaw's told of a long experience with surgery for carcinoma of the cervix, but went on to say that after a thorough trial with radium, he was convinced that the latter was the better method of treatment. That this was so is the least of the lessons to be gained from this presentation. The most important is that we must keep our minds open, alert and analytical so that we do not miss the import of new approaches to the cure of this or any other disease. It is true that we are radiologists and use radiation for the care of our patients, but we must not be blind to the fact that sometimes other methods of therapy are better than ours. Particularly, however, we should always remember that there is almost certainly an opportunity for each of us to improve on his own current method.

The most vocal of present day surgeons who are advocating operation for carcinoma of the cervix, of course, is Meigs[2] of Boston. Dr. Meigs[3] said in 1944 that he was impelled to use radical surgery in the treatment of this condition because at Pondville Hospital only 10 per cent of all cases survived five years, and that at the Massachusetts General Hospital, of 395 cases treated, only 15.9 per cent had a five year cure. In all of his presentations Dr. Meigs insists that the best method of treatment generally for carcinoma of the cervix is by radiation, and that what he is doing is conducting an experiment in the surgical treatment now that we have antibiotics, blood substitutes, and so on. He has shown us that in selected cases he is able to operate upon his patients with almost no mortality. Of 30 cases in Stage II he had a 60 per cent salvage from one to five years. Bonney[4 5] reported 500 cases operated upon radically with a 14 per cent operative mortality and a 40 per cent five year survival. His over-all operative rate was 63 per cent, so that his absolute five-year cure rate was only 25 per cent. Of the patients whom he operated upon, 40 to 43 per cent had positive lymph nodes, and of these 22 per cent lived for five years without evidence of disease. Those who were node free had a survival rate of 53 per cent. As noted above, however, his absolute cure rate was 25 per cent. According to Bonney the advantages of surgery are, first, it is easier to conceal from the patient the nature of disease; second, the patient need not return if recurrence supervenes, and therefore no suspicion is awakened of the nature of the ailment; third, there is cure of some patients with carcinomatous nodes which radiation does not care for.

The present day operative attack on carcinoma of the cervix is a combination of the Wertheim operation plus lymphadenectomy as advocated by Taussig.[6] The entire philosophy regarding the surgical care of this condition seems to be based upon an assumed fact that carcinoma of the cervix metastatic to lymph nodes cannot be cured by radiation. Whether or not this is a fact remains to be proved. Morton, working with Lynch at the University of California, found that in 28 cases without preoperative radiation 39.3 per cent had positive lymph nodes at the time of surgery. Of 35 more advanced cases with preoperative radiation, only 11.4 per cent had positive nodes. These findings point strongly toward a controlling factor with radiation. In a later paper, however, Morton[7] says that he is not quite sure that lymph nodes can be controlled by radiation alone. A recent study by Brown[8] who operated upon patients after full courses of radiation showed some evidence of change in the irradiated lymph nodes. Whether or not actual neoplasm existed in the nodes before the radiation could not be stated with certainty. Although the indications for surgery are being broadened as experience shows that this procedure can be done without significant mortality, there is still a great selection of patients. Only those who are relatively young, who are thin and who have no other disease, whose general condition is good and who have good veins for supportive procedures are used as subjects. Generally, only Groups I and II League of Nations are considered for operation. Meigs is convinced that only radical surgical procedures are justified, and he insists that surgery is not competitive with radiation. Brunschwig, on the other hand, has said that since radiation has reached a plateau and is unable to produce increasingly good results, this method of treatment should be given up in favor of radical surgery. This statement was based on the fact that a sttudy of the results of two consecutive five-year periods at the Memorial Hospital showed essentially the same survival rate, 28 per cent. This, of course, is not the experience in most other clinics.

There are two main lessons to be gained from the re-emphasis upon radical surgery for this

condition. The first is that almost any abdominal surgeon without being particularly experienced in the pelvis considers himself capable of doing a radical operation of the Wertheim type plus, perhaps, lymphadenectomy. That this is a mistaken idea is attested by many of us who see patients come in with recurrent disease after relatively conservative operations and even after supra-cervical hysterectomies for carcinoma of the cervix. It is constantly stressed by Meigs, Brunschwig and others that the procedure is experimental, but the total effect as far as we can see it is to emphasize that surgery is an accepted method of treatment for this condition and to increase the number of inadequate operations. The second lesson and the one which I think is salutory is a rethinking by radiologists of their methods of attacking this disease. Many of us, I am sure, have simply thought of the condition as one which would naturally go to the radiologist because he was the court of last resort. Many had ceased to think of each patient as a special problem, requiring a great deal of thought and care. We were perhaps prone to think of all of these patients as being poured as from a common mold, and the problem was not approached from an individual point of view, either regarding the psychic make-up of the patient or her physical illness. This second lesson, therefore, is proving to be of great value. It is spurring many of us to a realization that careful thought, careful study of each patient, careful measuring of dosage and biologic effect as well as the general effect upon the patient will result in better care of these patients and more five-year cures.

Our problem then is to deliver a lethal dose of radiation to the tumor while sparing the normal tissues as much as possible. This problem, I am sure, can be attacked in several ways.

From our own experience I am convinced that external radiation alone is not sufficient. Direct radiation of the primary neoplasm must also be given. Our present method of treatment is essentially as follows: As soon as the lesion is proved, the patient is sent to the Department of Radiology to begin external radiation. This is done by treating through an anterior and posterior 15x15 cm. field, two lateral 10x15 cm. fields, and two gluteal 10x10 cm. fields. Each of two fields is given 200 air roentgens a day. Careful calipering of the patient enables us to figure the delivered dose to the cervix and to the parametrium. We consider these points separately, since the local treatment is usually quite sufficient to take care of the primary lesion. Experience shows that the patient is more likely to die of spread of the disease into the parametrium than from the primary. Consequently, when there is no particular complication such as extension into the vagina, the midline is protected with a lead strip 2 cm. wide, when the anterior and posterior fields are irradiated. Our tumor dose is measured at a point 5 cm. lateral to the midline which puts it well out to the lateral pelvic wall. Contributions to this point come from the anterior, posterior, one lateral and one gluteal field. We endeavor to deliver at least 4,000 tumor roentgens to this point in each side of the parametrium. When the course of external radiation is about two-thirds complete, the local lesion is treated by radium, usually with the help of the Ernst applicator. We have found this instrument sufficiently flexible to use in most of the cases. We think it is important to give the radium during the course of external radiation so that there may be a summation of the external and internal radiations. I am sure that our philosophy on this point is not shared by some, but we think it is one of the strong points in our technic. With this method there is no question that there is a morbidity consisting mainly of proctitis, although cutaneous reaction is also manifest in practically every case. These reactions, however, do not disturb us and ordinarily they disturb the patients very little, particularly when they are warned beforehand about them. Our use of lateral fields is also condemned in some quarters since it is thought that these fields contribute too little to the tumor and too much to osseous changes. However, it should be remembered that the first group of cases of fractured femoral necks following irradiation for carcinoma of the cervix as reported by Dalby, Miller and Jacox did not have lateral fields. Our own experience indicates that with the delivery of heavier doses to the pelvis we are more likely to get fractured femoral necks, and this complication now occurs in about 2 per cent of our cases. A recent careful pathologic study correlated with operative reports, however, indicates that these fractures will respond just as well as the ordinary traumatic fracture provided they are cared for early. Close cooperation with our Department of Orthopedics gives us heart to continue the method as we are now

using it. This is particularly true because our five-year survivals have increased considerably since we have given this heavier dosage. The technic which we now use, however, was not developed overnight. Twenty years ago we treated these patients only through an anterior and posterior 20x20 cm. field and gave not more than 2,000 air roentgens to each field. This delivered a tumor dose varying from about 1,600 roentgens to perhaps 2,100 or 2,200 roentgens. Over the years, however, we have changed our technic by adding lateral fields, gluteal fields, and by shrinking the anterior and posterior fields so that we now irradiate less normal tissue. We have also increased the radium dosage and to these two factors we attribute the betterment of our results. Between 1926 and 1937, we treated 572 cases and of these 25.7 per cent lived five years without evidence of disease. In the five years from 1937 to 1942 inclusive we treated 411 cases of whom 37 per cent lived five years without evident recurrence. This is an improvement of about 50 per cent over the previous results. The five-year survival rate for the entire period was 30.4 per cent. A study of 337 cases treated entirely in our hospital between 1937 and 1942 also showed some interesting figures. The over-all survival was 39.4 per cent. Of this group 183 were treated by x-ray and radium and of these there was a five-year survival rate of 51.9 per cent. We are convinced, therefore, from our own experience and from that of many others that there has been during the past 25 years a steadily increasing rate of survival for patients treated with x-ray and radium for carcinoma of the cervix. It must be emphasized again that there is no selection of cases for the radiologist as he cares for these patients. In our own institution as in many others any patient on whom a diagnosis of carcinoma of the cervix is made, regardless of whether she is treated or not, is included in the statistics. This is not true of those who operate upon this condition.

That there is no single good method of treatment of carcinoma of the cervix is attested by the fact that Heyman in Stockholm, Paterson in Manchester, Regaud in Paris, Pitts and Waterman[9] in the United States, as well as many others, have shown that careful attention to details can bring good results through different means. I think there is no question that our present technic will again be altered further to individualize the treatments and to reduce to an irreducible minimum the complications which arise from the treatment.

I wish to stress again that we as radiologists cannot afford to sit idly by and treat our patients with carcinoma of the cervix just as we have treated them for the past 20 years. There is ample evidence from many quarters that thoughtful care and skilful execution is able to produce increasingly good results. We must take our cue from the surgeons who are exploiting every possible angle of approach in the care of this disease and leave nothing undone which offers any hope of success.

It is unfair for us to belabor our surgical colleagues who do not adequately treat these patients by the means at their disposal while at the same time we continue to use antiquated methods of radiation therapy. It is just as bad for us to give patently inadequate treatment by radiation as it is for the surgeon to do an inadequate surgical removal of a carcinoma of the cervix.

I am convinced on the other hand that there is a place for surgery in the treatment of carcinoma of the cervix when done by the expert. In the earliest cases I am also convinced that it is the equal, not the superior, of good radiation. Its main place is in the care of those relatively few radio-resistant tumors which remain after intensive radiation, and the occasional case which justifies the use of the radical procedure, as advocated by Brunschwig. In conclusion, let me say that the new trial of surgery as a method of treatment for carcinoma of the cervix should act as a stimulus to all radiologists to seek by unremitting care and application to improve their own method of treatment. If this is done I am sure that radiation will always prove to be far superior to the usual surgical methods as applied to this condition. Inadequate and poorly planned radiation offers no more to the patient than inadequate surgical attack. It is up to us to see that our own methods are constantly improved.

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DISCUSSION (*Abstract*)

Dr. Charles L. Martin, Dallas, Tex.—I am much interested in the relative advantages and disadvantages of the various technics now used in the treatment of cancer of the cervix.

Because of the limited time I shall comment only upon Dr. Kerr's statements favoring surgery for radio-resistant tumors and far advanced lesions. All radiologists would welcome surgical help in such cases but the reliable statistics now available indicate that surgeons have little to offer. The poor results obtained by Heyman and Belonoschkin with a series of 67 radio-resistant cases subjected to the Wertheim operation suggest that radio-resistant tumors are incurable by any known method of treatment. A recent report made by Brunschwig and his associates covering a series of advanced cases subjected to their radical procedure without a single patient's surviving more than 8½ months, seems to cast grave doubt on the value of ultra radical surgery. When all of the known data is considered carefully, irradiation therapy in competent hands still seems to be the best form of treatment for cancer of the uterine cervix.

THE MATERNAL BREAST*

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It is strange indeed that in the past few decades few women are either willing or able to nurse their offspring. Surely these breasts were developed and physiologically prepared for the reception of the newborn but far too few women will avail themselves of the advantages already prepared for them.

Most psychiatrists and the majority of pediatricians agree that the benefits received by the breast-fed child are far greater than those of the artificially fed. Nearly all obstetricians believe that the physiological processes of involution are hastened as a result of infant suckling because of a definite relationship between the mammae and the uterus. Stimulation of the breasts will cause uterine contractions, as evidenced by "after pains" following breast feeding, which aid in the process of involution.

Breast feeding is economical and this is no small factor during these times of inflation. Furthermore the mother's milk transmits immunity to various diseases, thereby reducing the incidence of neo-natal morbidity.

Why then is the percentage of capable and contented nursing mothers steadily declining? Several factors may be considered.

(1) *Socio-Economic Factors.*—During these days of mad hustle and bustle, the high cost of living, and the fact that many of the husbands are or have been in the armed service, women by the thousands have been pressed into offices and industries in order to provide, or supplement, the necessary finances to raise the family. Obviously their offspring must and should be weaned. However, one or two weeks nursing will not interfere with these outside activities and both mother and child will benefit from this brief endeavor. Cessation of lactation is readily accomplished by appropriate methods.

(2) *Community Activities.*—Modern society leaves many mothers little time to spend in the home. Social and philanthropic organizational activities have placed a terrific burden upon them. Of necessity "sitters" must be employed to care for their siblings while the young mothers are attending committee meetings, welfare clinics and what not. Naturally they cannot nurse their children. How much better for all concerned if some of our ladies, whose children have passed adolescence and are more or less self sufficient could assume more of the civic duties and thus allow the young mother properly to care for her brood as Nature intended?

A very apt comment appeared in the September 1951 issue of the *Readers' Digest.*

"Why are we young mothers having so much difficulty nursing our babies?"

"Well," the physician said after a moment's consideration, "you take a cow and chase it out in the pasture. Run it around the pasture full speed all day long. Then when evening comes, rush her back to the barn. That cow won't give any milk either."

(3) *Vanity.*—Too much emphasis is now placed on outside activities. Social functions must be attended and entertainment offered. These functions would have to be forfeited should the young mother be compelled to return home

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every three or four hours to nurse her child. This is pure selfishness on the part of the mother.

Fear of ruining the figure is frequently offered as an excuse for not nursing. The husband is often the instigator of this opinion. This premise is false. Rarely do the breasts lose fullness and become flabby and pendulous following cessation of lactation.

(4) *Psychogenic Factors.*—Wars and threats of war result in worry, a sense of insecurity, broken homes, widowhood and fatherless children. During the last war it was common to see "War Widows" living with relatives with resultant domestic discord. Mental, emotional or spiritual unrest will interfere with normal lactation as easily as, or more than, physical disability.

Previous disappointing experiences at nursing play definite roles during subsequent puerperia. A past history of sore or cracked nipples, breast abscess or a sudden cessation of lactation results in an indelible defeatist attitude on the part of the mother. Often the unfortunate experiences of one patient in a ward will reflect on the mental attitude of all other patients in the room with resulting feeding problems. A little time spent in explanation and reassurance can overcome this obstacle.

(5) *Exhaustion.*—Physical and mental exhaustion early in the puerperium play prominent roles in subsequent lactation. Few, if any, patients are capable of supplying an adequate amount of milk if they are allowed to conclude their pregnancies in a weakened or run down condition. They must be brought to term in the best possible physical condition, devoid of mental worry. Every effort must be made to conserve the mother's strength, blood loss, fluid and electrolyte balance during labor, and the delivery should be accomplished with a minimum of trauma and loss of blood.

It is of the utmost importance that the mother have adequate rest following delivery of the child. Overzealous, overpowering and over enthusiastic and garrulous friends, relatives and well wishers invariably leave the patient exhausted physically and mentally. The result is a diminution of the milk supply, a frustrated mother and a crying baby.

(6) *The Physician.*—I realize that I am treading on dangerous ground when I discuss this subject. However, I feel that we, as physicians, are largely to blame for the many "bottle babies." An immense load has been placed upon the shoulders of the practicing physician during the last decade. Throughout the past war, and as a result of the present emergency, many hundreds of doctors have seen or are experiencing service in the Armed Forces creating an extra burden on those of us on the home front. Our duties have multiplied many times and we have been deprived of sufficient time to spend with the individual patient. The tremendous increase in the birth rate over the past five years has placed a terrific load on all physicians, particularly upon the pediatrician. His duties have doubled and tripled. In order to save time and energy and many a call from distressed or exhausted mothers he has advised artificial feeding more and more. It does save time for him and results in fewer consultations. This is not the final answer to baby feeding problems, however. Are we sacrificing a normal and physiologic process, a function that definitely aids involution in the mother and increases her maternal instincts, and an added sense of security for the newborn child to satisfy the whim of the mother or the convenience of the physician?

Certainly there are in many patients factors that preclude attempts at nursing. Chronic debilitating diseases, breast neoplasms, non-erectile nipples and many other conditions may be listed in this category.

(7) *Ignorance.*—It is surprising indeed how few adolescent girls are taught the true facts of life. A large percentage of these individuals approaching maturity are largely or totally ignorant of their own anatomy and the functions of their specialized organs. Education from proper sources is woefully inadequate although great strides have recently been made, particularly in our public and higher educational institutions. A girl should be impressed that the main function of the breasts is to feed babies and it should be a privilege to use them for that purpose. If the Lord had figured out a better method of feeding children I am sure He would have made the necessary arrangements.

How then to achieve the goal of a happy lactating mother and a healthy contented child?

(1) *Education.*—As stated above, proper education of the adolescent should begin as soon as the child's inquisitiveness demands. This instruction should be given by the mother or father in all frankness, sincerity and without shame or embarrassment. Classes in physiology should be

included in all high schools and sex education in all colleges and finishing schools. Premarital consultation and examination with the physician should be an integral part of the girl's education. Needless to say this will require a great deal of time and patience on the part of the busy practitioner but the effort will be worth while.

(2) *Prenatal Care.*—During routine prenatal visits further encouragement should be given the patient regarding her motherly duties and their advantages. In the early stages of pregnancy no physical preparation need be offered save for a well fitting brassiere plus local cleanliness. The breasts should be lifted upward and to the midline. Tight binding supports should be avoided.

Beginning at the seventh month of pregnancy the nipples should be "toughened up" by a process of massage. Twice daily the nipple is pulled outward with a twisting motion as an ointment with a lanolin base is massaged into the tissues. It is amazing how quickly the nipple is toughened but yet made soft and pliable. This procedure will greatly decrease the percentage of sore or cracked nipples after nursing has been instituted. Dehydrating agents, irritating substances and traumatizing technics should be avoided as they tend to lead to subsequent complications.

(3) *Post-Partum Care.*—Immediately following delivery the breasts are thoroughly cleansed, the nipples swabbed with alcohol, dried, a square of sterilized waxed paper placed over the nipples and a firm (but not binding) uplift type of breast binder applied. The baby is brought to the breast twice during the first twenty-four hours, then every six hours the second day and finally every three or four hours, according to the wishes of the pediatrician or obstetrician. Before and after nursing the nipples are cleansed with a mild aqueous antiseptic solution (preferably not boric acid).

Considerable difficulty may be encountered in instructing both mother and child in the secret of successful nursing. However, patient, encouraging instruction from nurse and physician alike usually will be rewarded. Much trauma to the nipple may be avoided if the colostrum in the first postpartum days, and the milk after lactation has been instituted, are drawn to the surface by the simple method of manual massage and stripping of the breasts. The baby will thus not be required to struggle to draw the secretions to the surface and obtain its nourishment. It is also of utmost importance that the child get the entire nipple in its mouth. Grasping and chewing on a mere portion of the nipple inevitably resorts in considerable pain to the mother, a loss of interest on her part, a suppression or diminution of normal lactation and a hungry and dissatisfied child. Sore, fissured and frequently bleeding nipples are the aftermath.

(4) *Diet.*—Frequently the question is raised as to what foods should be eaten to increase the supply of milk. The answer is a well rounded diet composed of adequate amounts of proteins, fats, carbohydrates, minerals and vitamins. Special attention should be given to milk products, soups and cereals. Additional B complex vitamins are thought to be of value and may be prescribed without harm. Injection of lactogenic hormones has proven useless.

The use of alcohol and tobacco may be discussed together. Resort to either in moderation is not detrimental to mother or child. It is only with excessive usage, as with everything else, that harmful results occur. The addict, whether of nicotine or alcohol, is a pathologic case and is a mentally sick patient. This mental disturbance will in turn interfere with normal lactation. It is the primary disease that disturbs normal milk production, not the effects of such indulgence.

Primary engorgement of the breast is due to circulatory stasis and not to excessive milk production. During this stage of congestion the fluid intake should be limited. It has been found that hot-packing of the breast before nursing stimulates the free flow of circulation and milk. Cold compresses cause vasoconstriction and add difficulty in emptying the breast. Unrelieved engorgement may be followed by serious aftermaths. Should the child be unable to empty the breast completely the patient is instructed to strip the breast manually. This procedure has been proven much more satisfactory than the use of mechanical devices. It not only prevents undue congestion but also aids in stimulation of the lactiferous glands to the greater production of milk that will be needed as the child grows and requires more food. Several years ago the practice of applying dry sterile gauze pads under the binder for the purpose of absorbing excessive secretions was discarded and was replaced by placing a piece of waxed paper with an adequate

amount of some bland lanolin-based ointment over the nipple. It has been proven that the incidence of sore and irritated nipples has been greatly lessened since this procedure was instituted.

Should, for any reason, lactation be deemed inadvisable the administration of adequate doses of estrogenic or male sex hormones or a combination of the two will usually accomplish the desired results within several days. A tight breast binder, limitation of fluid intake and a saline purge are helpful adjuncts. It is advisable to empty the breasts before the binder is applied. Repeated pumping serves to stimulate the breast to increased secretion and should be avoided except in rare instances. Occasionally subsequent engorgement follows efforts to dry up breasts and great relief will be given to the patient by relieving this pressure. The use of camphor or camphorated oil is undesirable, unless one wishes a questionable or telltale odor about the premises.

Cracked, fissured or bleeding nipples should immediately arouse the attention of the obstetrician in order to prevent more serious complications. These complications are usually seen in women with flat or inverted nipples in which the child has great difficulty in grasping the nipple or in those who allow the baby to nurse for too long a period of time. They occur in those who have not properly prepared themselves for nursing during the latter months of pregnancy.

Nipple shields are extremely useful in nonerectile cases. They prevent friction and further irritation from clothing. They may be used in conjunction with "healing ointments" such as vitamin, penicillin, sulfa, or aureomycin ointments. Many pharmacopeial companies produce effectual preparations. Occasionally resort to compound tincture of benzoin or 2 per cent silver nitrate plus external dry heat is necessary to relieve local lesions. Benzoin may be applied after each nursing without danger. Silver nitrate may prove to be irritating and thus should be used but once a day. When the breasts are too irritated for the reception of the child a breast pump may be employed temporarily and the extracted milk fed the child until nursing is reinstituted. Seldom is it necessary to halt lactation because of fissured nipples.

The usual infective organism in mastitis has been found to be the Staphylococcus aureus; however, mixed infections are not uncommon. Because of the almost universal, and at times indiscriminate, use of the various antibiotics for all types of infections and conditions this organism is becoming increasingly resistant to penicillin and to many of the sulfa preparations. Aureomycin, in therapeutic doses, seems to be the drug of choice. Stubborn fissures may be healed and the early (or lymphatic) stage of infection may be arrested. Resolution of early abscess formation may follow adequate dosage of aureomycin. In advanced cases this drug will rapidly aid in localization of the infection and thus enhance early surgical intervention. The child is allowed to nurse from the unaffected breast with little danger. Infrequently a mild gastro-intestinal upset or mild case of diarrhea is encountered in the child. The affected breast is stimulated, by pumping, to further secretion and as soon as the infection has subsided re-establishment of nursing is encouraged. It must be admitted that convincing the patient, who has passed through this unfortunate experience, to continue to nurse is a Herculean task, and usually results in failure.

There is, however, no substitute for immediate surgical incision and adequate drainage when faced with true abscess formation. The lines of the incision should be made in a radial fashion to preserve the normal blood supply. This procedure is accompanied by proper antibiotic therapy. When surgical intervention is necessary, lactation should be suppressed and the child placed on suitable artificial feedings.

Radiation therapy of mastitis, which in the past gave promise, has largely given way to treatment with antibiotics. Its results cannot compare to more modern methods.

SUMMARY

Breast feeding is the method of choice and can usually be accomplished by proper education and encouragement of the patient along with special preparation of the pre- and neonatal breast. The patient must be made to feel that it is her duty and privilege to nurse her offspring. Much can be done to further an adequate milk supply and to prevent complications brought on by improper handling of the breasts. Therapeutic measures for the infected mammae are discussed and evaluated. Certainly a happy and healthy mother and a contented thriving child are well worth all the painstaking and trying efforts undertaken by the patient physician.

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PRESENT STATUS OF THE USE OF ULTRASONIC ENERGY IN PHYSICAL MEDICINE*

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The employment of high-frequency acoustic vibrations for underwater communication beginning about thirty years ago inaugurated the scientific studies of ultrasonic energy. Since then several thousand articles dealing with various applications of ultrasonic energy have been published. Within the past few years, several hundred articles have been published concerning the medical uses of ultrasonic energy. Most of the publications dealing with such medical uses have emanated from Germany, Austria and other European countries. Up until the present time, American physicians have shown little interest in this subject.

Unfortunately the European medical literature has tended to exaggerate the value of ultrasonic therapy just as the European medical literature of fifteen years ago exaggerated the value of short-wave diathermy. Some conception of the extensive use of ultrasonic therapy in Europe can be gained by consideration of the fact that it was recently reported[1] that by May 31, 1951, 5,350 ultrasonic devices were being employed by physicians in western Germany alone. This indicates that there is one ultrasonic machine in medical use for every six physicians practicing in that country.

About fifteen years ago, German and Austrian medical literature was filled with exaggerated and uncritical claims concerning the value of short-wave diathermy in a vast number of diseases. It was contended that short-wave diathermy would be helpful in treatment of malignant disease and it was also claimed that short-wave electrical radiations produced a number of effects other than those attributable to heating of tissues. Today the German and Austrian medical literature is filled with exaggerated claims concerning the value of ultrasonic energy in a great number of diseases and certain German physicians have claimed that ultrasonic therapy would be of value in the treatment of malignant disease. Likewise, German physicians have been claiming mysterious effects of ultrasonic energy other than those attributable to heating of tissues.

Fifteen years ago European short-wave diathermy machines were being imported in large numbers into the United States and at that time American manufacturers began producing such machines in even larger quantities. Today European ultrasonic devices are being imported into America in ever-increasing numbers and American manufacturers are starting to make ultrasonic apparatus for employment in medicine.

The medical employment of ultrasonic energy for therapeutic and diagnostic purposes appears promising provided such energy is employed properly by skilled physicians. It is therefore of the utmost importance for American physicians to become acquainted with the medical uses of ultrasonic energy, to examine carefully the evidence concerning its diagnostic and therapeutic usefulness, and to determine promptly the limitations and dangers of such diagnostic and therapeutic applications. Studies which we have already conducted convince us that the therapeutic application of ultrasonic energy in only slightly larger doses than those usually recommended may cause damage of an irreversible nature to certain living tissues and that such overdoses are potentially dangerous. It is apparent that the margin of safety is much narrower with ultrasonic diathermy than with short-wave diathermy.

ULTRASONIC APPARATUS

Quartz crystals and certain other crystals will become electrically charged on opposite surfaces when they are subjected to mechanical pressure. This property is spoken of as the "piezo-electric effect." The reverse effect will also occur and the crystal will undergo a mechanical vibration when opposite sides are subjected to an alternating electric field. Commonly, ultrasonic vibrations are produced by employing this reverse effect on piezo-electric crystals. A piezo-electric transducer is constructed which will convert electrical oscillations into mechanical vibration which in turn will produce high-frequency sound

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*Report of studies performed in the Mayo Clinic and Mayo Foundation in conjunction with J. F. Herrick, Ph.D.; Carl F. Schlotthauer, D.V.M.; Khalil G. Wakim, M.D., Ph.D., Division of Experimental Medicine; Warren A. Bennett, M.D., Section of Pathologic Anatomy; Joseph M. Janes, M.D., Section of Orthopedic Surgery; Edward H. Lambert, M.D., Ph.D., Section of Physiology; and Paul A. Nelson, M.D., Thomas P. Anderson, M.D., Ralph E. DeForest, M.D., and Walter J. Treanor, M.B., Fellows in Physical Medicine and Rehabilitation.

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waves. These vibrations are then transmitted through a "sound head" or applicator to the region which is to be treated.

Ultrasonic radiations cannot pass through a vacuum as do electromagnetic vibrations but require a material medium for their propagation. Ultrasonic energy travels approximately four times as fast in liquids and up to twenty times as fast in solids as it does in air. These high-frequency sound waves tend to travel in straight lines and if the critical angle is exceeded, they are completely reflected at the interface between two mediums. These waves also exhibit interference phenomena and are refracted. A particle in the ultrasonic field is forced to vibrate at a rate of 800,000 cycles per second yet the particle is not displaced from its position of rest by more than 1/100,000 of a centimeter.

EFFECTS OF ULTRASONIC RADIATION

Not only does ultrasonic energy produce heating of living tissues but when an ultrasonic wave is passed through a liquid, it alternately compresses and separates its component particles. With high enough intensity, the disruptive forces exceed the intermolecular bonds and the medium is actually split apart. This phenomenon, which involves not only the formation of cavities but also their sudden collapse, is called "cavitation." Heating and cavitation are two of the principal effects of ultrasonic radiation. Other mechanical, thermal, chemical, biologic and physiologic effects of ultrasonic energy have been described elsewhere by Nelson, Herrick and me.[2]

Almost twenty years ago it was shown[3] that bone marrow could be heated to high temperatures by ultrasonic radiation and it was suggested that the therapeutic possibilities of ultrasonic diathermy should be studied. Furthermore, many European physicians have mentioned an "analgesic effect" of ultrasonic radiation. Among the diseases treated by ultrasonic therapy in Europe have been listed herpes zoster, intercostal neuralgia, sciatica, lumbago, multiple sclerosis, myalgias, neuralgias, periarthritis (humeroscapular), spondylitis (deforming), and trigeminal neuralgia. Particularly good results were claimed in treatment for various types of neuralgia.

Pohlman[4] concluded that in order to provide the correct dose for treatment, an intensity of ultrasonic radiation of 2 to 5 watts per square centimeter should be employed. He said that such a dose should produce erythema without causing the development of edema. Furthermore, it has been concluded that a frequency of 800,000 cycles per second is most satisfactory for therapy. (This is the frequency which has been employed in the experiments I am about to describe).

On completing a survey[2] of the literature of ultrasonics in medicine, we concluded that despite enthusiastic claims of some European investigators, there was too little known about the physiologic effects of ultrasonic energy for us to recommend its use in treatment of any disease of man, but at the same time we concluded that the possibilties of ultrasonic energy were such that further careful scientific evaluation of the diagnostic and therapeutic applications was indicated. Therefore, we began various laboratory studies on living animals. Because of the report[3] of the effectiveness of ultrasonic energy in heating bone marrow, we began with studies of this subject.

RELATIVE HEATING OF BONE MARROW, BONE CORTEX AND MUSCLE

In developing this study,[5] we had constructed an efficient ultrasonic generator which produced a maximal output of 15 watts. The area of the crystal employed in this apparatus is approximately 5 sq. cm. Also, we imported from Germany a Siemens "sonostat" which delivered up to 60 watts of ultrasonic energy. In this device the piezo-electric crystal has an area of 10 sq. cm. and is mounted in a grounded metal unit (the applicator or "sound head") in such a way that the ultrasonic waves are conducted through a metal diaphragm.

We measured the temperature of bone marrow, bone cortex and muscle by means of thermistors and thermocouples. These temperature-measuring devices were placed in the bone marrow, bone cortex and muscle of the hind leg of an anesthetized dog. Repeated studies indicated that an application of 5 watts for one and a half minutes produced an average rise in temperature of the bone marrow of 5.4° C., of the bone cortex of 5.9° C., and of the muscle of 1.1° C. When the wattage was increased from 5 to 10, these temperatures were almost doubled and the average rises were as follows: for bone marrow, 10.3, for bone cortex, 10.5, and for muscle, 2.2° C. Thus in anesthetized dogs, when the wattage was increased from 5 to 10, the rise in temperature approximately doubled.

Following ultrasonic irradiation at an output of 5 watts for only one and a half minutes, the rises of temperature of bone cortex and bone marrow were slightly greater than those obtained after thirty minutes of microwave irradiation at an output of 65 watts. There was no apparent gross damage to superficial tissues following such applications of either microwave or ultrasonic energy.

EFFECTS OF ULTRASONIC ENERGY ON THE NERVOUS SYSTEM

In this study,[6] fairly heavy doses of ultrasonic energy were applied to the lower portion of the spinal cord and to peripheral nerves of living dogs. Objective observations of extent of paralysis and of alteration of action potentials of nerves were made. Rises of temperature produced by ultrasonic energy were recorded and histopathologic changes caused by the ultrasonic energy in the nerves and spinal cord were also demonstrated.

Of particular interest were our observations on the effects of ultrasonic energy on action potentials. When maximal doses were applied, there was complete block of the action potentials in 8 of 12 dogs within ten minutes or less and there was only partial recovery thereafter. Further study indicated that the action potential of the sciatic nerve was decreased by direct heating in a manner which was strikingly similar to that produced by ultrasonic energy.

When temperatures were recorded in the sheath of the sciatic nerve, it was found that the range of temperature at which the action potential becomes decreased is narrow, ranging between 48 and 52° C. If ultrasonic energy produced only partial decrease of action potentials, subsequently recovery was usually complete, whereas if the action potential was completely blocked, recovery usually was only partial or there was no recovery.

When maximal doses of ultrasonic energy were applied to the lower portion of the spinal cord or to the sciatic nerve for periods of thirty minutes, there was usually complete paralysis and in the spinal cord there was, on necropsy, evidence of marked gross pathologic changes with severe necrosis. When ultrasonic energy was applied in maximal doses over peripheral nerves, subsequent histologic sections revealed marked degenerative changes in the nerve while the surrounding muscle remained normal in appearance, thus indicating that there was selective damage to nerves as compared with muscles.

RELATIVE EFFECTS OF ULTRASONIC ENERGY AND HEAT ON CONDUCTION OF NERVES

In these studies,[7] we applied ultrasonic energy to the sciatic nerve of a bullfrog between stimulating and pickup electrodes, using a dosage of 4 watts per square centimeter. If a coolant was circulated around the nerve which prevented any rise of temperature during the application of ultrasonic energy, no change in the action potentials occurred. If the circulation of the coolant was stopped, the ultrasonic energy caused a rise of temperature in the nerve and decrease of the action potential occurred, indicating a block of conduction in some fibers. Also there was some evidence of a differential effect on the "A" and "B" fiber groups.

When a thermode was employed to heat the nerve, such direct heating produced exactly the same effects on action potentials as did heating by means of ultrasonic energy. The temperature at which complete block of fiber groups occurred was essentially the same whether heating was produced by the thermode or by ultrasound. These experiments suggested that ultrasound of intensities and frequencies employed in physical medicine at the present time has no effects on conduction in peripheral nerves other than those produced by the rise of temperature.

EFFECT OF ULTRASONIC ENERGY ON THE GROWING ENDS OF LONG BONES

When we studied[8] the effect of ultrasonic energy as applied to the hind legs of young dogs (4 to 6 months old), we found that severe damage could occur. The dogs were anesthetized and the sound head was kept moving to minimize the effect of standing waves and to distribute the energy throughout the bone. In a typical study when eleven ultrasonic applications of 10 watts for five minutes were given to 1 young dog, marked damage occurred. Eleven weeks after the last application, a roentgenogram showed obliteration of the lateral half of the upper tibial epiphyseal line, destruction of the medial part of the medial tibial plateau, erosion of the surface of the medial condyle of the femur and partial obliteration of the lower femoral epiphyseal line.

In another typical study, four ultrasonic applications of 10 watts for ten minutes were made to the leg of another young dog and two weeks

later a fifth application was made. A roentgenogram made nine weeks and three days after this last application revealed obliteration of the upper tibial epiphyseal line in its lateral half, rarefaction in the condyles of the femur, obliteration of the lower femoral epiphyseal line, dislocation of the knee joint and swelling of the tissues.

HISTOPATHOLOGIC CHANGES PRODUCED IN VARIOUS TUMORS BY ULTRASONIC ENERGY

When we applied ultrasonic energy in maximal doses to various tumors of animals,[9] we found no remarkable effects. When a transmissible lymphosarcoma of the type originated by Carl Olsen, Jr., was implanted in the breast of a chicken and five days later this tumor was treated by the application of 15 watts of ultrasonic energy for thirty minutes on two occasions, there was considerable necrosis and destruction of the skin and underlying tumor. However, there was still a solid mass of tumor infiltrating the muscle.

Following the application of ultrasonic energy of 15 watts for seventy-five seconds over a transmissible glioma of the ependymoma type in a mouse, there was considerable necrosis of the tumor but still much viable tumor tissue remained.

On the application of 20 watts of ultrasonic energy for ten minutes to a Walker carcinoma in a rat, there was focal necrosis of the skin, muscle and tumor but not complete destruction of the tumor.

On the application of ultrasonic energy for thirty minutes at 15 watts over a spontaneous squamous cell carcinoma of a dog, there was necrosis of the tumor but there was also much viable tumor tissue remaining.

On the application of 15 watts of ultrasonic energy for thirty minutes over a plasma cell myeloma of a dog, there was superficial necrosis but there was little or no effect on the tumor.

HISTOPATHOLOGIC CHANGES PRODUCED IN NORMAL TISSUES BY ULTRASONIC ENERGY

On exposure of normal chicken liver to a maximal dose of ultrasonic energy, an area of necrosis developed in the liver immediately beneath the breastbone. Three days after an application of 25 watts of ultrasonic energy for four minutes to the skin of a dog, microscopic examination revealed ulceration of the epidermis with necrosis of all the elements including the muscle. There was selective destruction of hair follicles.

One application of 15 watts of ultrasonic energy for thirty minutes to the testes of a dog produced marked destruction of all the cells except the basal elements in the seminiferous tubules.

One hour after an application of 20 watts of ultrasonic energy for ten minutes to the intestine of a rat, microscopic examination revealed diffuse necrosis throughout the thickness of the intestinal wall. This necrosis occurred at the point of a gas bubble in the intestine which acted as a barrier, reflecting the ultrasonic energy and severely damaging this portion of the intestine because of the extra exposure produced by the combination of the original radiation and the reflected radiation.

The changes in muscles produced by maximal doses of ultrasonic energy included edema and interstitial hemorrhage followed by degeneration of the fibers, increase in sarcolemma cells and hemorrhage. Finally, collapse of the muscle fibers was noted while there was degeneration of the fibers with calcification.

Maximal doses of ultrasonic energy applied over the spinal cord produced necrosis throughout its entire thickness with extensive destruction of myelin and all the elements of the cord. This caused complete paralysis.

Peripheral nerve fibers exhibited myelin degeneration which often was patchy but sometimes was rather diffuse. Swelling and lobulation of the axons accompanied the destruction of myelin.

When maximal doses of ultrasonic energy were applied to mature bone, there was fragmentation of the trabeculae with hemorrhage and destruction of the marrow. When such doses were applied to immature bone, there was erratic growth of cartilage which was irregularly ossified and the marrow was markedly destroyed.

CONCLUSIONS AND COMMENT

Applications of ultrasonic energy as described can produce sharply localized heating of living tissues and can cause selective heating of bone cortex and bone marrow as does no other source of energy employed so far for medical diathermy.

If ultrasonic diathermy is employed clinically, a wide margin of safety with regard to dosage is necessary because of the unexpected variations which frequently arise.

Ultrasonic energy applied in maximal doses over the lower vertebrae of dogs will produce paralysis of the hind legs and tail. Ultrasonic

energy in the amount of 3.0 to 5.8 watts per square centimeter when applied to the midthigh will produce complete blocking of, or at least 50 per cent decrease in, the action potential of the intact sciatic nerve in 60 per cent of dogs so treated. Recovery will usually be complete when the action potential has been only partially decreased by the ultrasonic energy but recovery will generally be incomplete when the amplitude of the action potentials has been completely flattened. Direct heating produces an effect on the action potentials that is strikingly similar to the effect produced by heating with ultrasonic energy. Ultrasonic energy produces a greater destructive effect on the spinal cord than on the sciatic nerve.

Ultrasonic energy of the intensities and frequencies employed in physical medicine probably has no effect on conduction in peripheral nerves other than the effects produced by the rise of temperature. Ultrasonic energy when applied as described is extremely destructive to the growing bones of the dog. Therefore, until safe doses are clearly determined, ultrasonic therapy should not be applied to growing bones.

Among the tumors we have treated (including transmissible lymphosarcoma, transmissible glioma of the ependymoma type, Walker carcinoma, spontaneous squamous cell carcinoma, and plasma cell myeloma), ultrasonic energy produced no demonstrable selective action. There was as much destruction of normal tissues as there was of the tumor. It was possible to cause necrosis at will in various tumors but never possible to destroy them completely.

In normal tissues ultrasonic energy can produce markedly destructive reactions. These destructive changes can occur at the point of application of the ultrasonic energy or throughout the pathway of the radiation through the tissues or at the point of exit. The degree of destruction varies according to the type and density of the tissues and according to the presence or absence of fascial barriers. The reactions obtained in various animals were similar and varied not with the animal but with the intensity and duration of the treatment.

In nearly all our studies, maximal doses were employed. However, except in one study, the doses did not exceed even half those which are available on one of the machines commonly employed by physicians. The maximal dosage we employed (except in a few instances) was 25 watts for thirty minutes. The machine is capable of providing 60 watts for indefinite periods of time. Therefore, it is evident that such a machine when employed at maximal dosages can produce severe damage of many types of tissue. The spinal cord, peripheral nerves, testes, growing bones and hair follicles appear to be particularly susceptible to damage.

The danger of intensification of dosage by reflection from fascial barriers or gas pockets must always be considered. The effects of ultrasonic energy on living tissues appear to be chiefly those of heating.

The studies which have been described have been carried on continuously over the past three years and have covered rather fully the effects of maximal dosages of ultrasonic energy on living animals. Now we hope to investigate the effects of smaller dosages and to attempt to determine what the optimal dosages, if any, may be. It is obvious that ultrasonic energy is a potent destructive agent which may be extremely dangerous if employed indiscriminately by unskilled persons. It also seems apparent that continued laboratory investigations of the therapeutic and diagnostic possibilities of this new and powerful physical agent are justified. In proper dosage, ultrasonic energy may prove to be a valuable diagnostic and therapeutic agent.

From a diagnostic standpoint, Ludwig and Struthers[10] have developed a method for locating nonradiopaque gallstones and foreign bodies at operation by ultrasonic means. Wild[11] has devised a method of measuring the thickness of the intestinal mucosa by ultrasonic methods and Hueter and Bolt[12] have devised a procedure for performing ventriculography by ultrasonic means (sonography).

From the therapeutic standpoint, it must be remembered that many potent therapeutic agents are dangerous in overdoses. When no anesthesia is employed, pain will serve as a danger signal and prevent overheating of tissues. In proper dosage, ultrasonic diathermy may well produce valuable selective heating effects not previously obtainable. The possibility that ultrasound may produce effects, other than thermal ones, on the tissues is recognized. Nevertheless the effects are obviously chiefly those of heating and there is no need for ultrasound to produce other mysterious effects for it to be of value in therapy. It must be realized that many thousands of patients have been treated with ultrasonic dia-

thermy in Europe without apparent harmful effects. Nevertheless it is believed that physicians should await further cautious study of ultrasonic therapy before employing it indiscriminately in practice.

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MEDICAL RESEARCH IN THE SOUTH GROWS APACE*

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This conversation was heard outside my office door many years ago:

"I wish I could get more research money for my department," commented the first speaker. The rejoinder of a colleague came instantly, "What you need, old fellow, is not more money but more ideas to spend properly the money which you already have." Then I heard a hearty laugh and departing steps.

Ideas undoubtedly come first. They do in any important undertaking: when right they attract research money magnet-like, as all of us know, yet a point more to be stressed at times.

I wish you might have shared the thrill of reading the reports on research which came from 27 schools of medicine, all but two, in 15 states and the District of Columbia in the southern region. These were requested as the basis for this paper and every one indicated marked research development and some almost phenomenal advances since the close of World War II, a period of approximately five years. It is doubted whether there has ever been a comparable period in the history of American medical education. It is definitely no longer necessary to turn to a very few centers, as in World War II, for special or routine research; the South has materially contributed to a redistribution of scientists.

Physical facilities, research personnel, and large support funds: these resources share somewhat equally in our new research emphasis. It was not intended that this report be quantitative but it is perhaps safe to say that money for research has increased from five to tenfold in our southern medical schools in the past half decade. It is stated in the 1950-51 *Report on Medical Education in the United States and Canada* by the Council on Medical Education and Hospitals of the American Medical Association, page 168, that such education in the United States this year will cost $74,350,000 and that this will be supplemented by $35,250,000 for research; thus, teaching budgets will be supplemented by research budgets by nearly 50 per cent. This ratio of funds available for investigative work to routine teaching budgets can be matched by southern medical schools, perhaps the greater majority of them, in fact.

How has this research achievement in the South been possible? You and I knew the story in general before the reports came in. After the war we were able to recruit large numbers of younger men with imagination, ideas, insatiable curiosity, and abundant drive to supplement the older men who had gone off to war or government services of one kind or another. Then came the generous grants from the Army, Navy, the Public Health Service, from the Atomic Energy Commission and others to supplement those which were continuing from regular budgets, from the pharmaceutical houses, the philanthropic foundations, industrial firms, individuals, and a variety of local, smaller foundations. With personnel eager to go, with money in hand, in many instances new physical facilities followed

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forthwith. This stream of events has been duplicated with increasing tempo on almost every medical school campus in the southland in the past five years.

This research development was naturally accompanied by certain fears. On some campuses the new money was not used to pay salaries of permanent faculty members. It was used, rather, for technicians, animals, equipment, laboratories, and so on. On others, new top personnel were brought to the institution under an agreement which gave no assurance of permanent employment and provided in some measure compensation for this disadvantage through higher salaries. Thus was continued a rather common practice in recruiting wartime research workers. It was probably inevitable, however, that the salaries of some regular faculty members should be supplemented from research funds as extra compensation for extra responsibilities. What we need certainly is long-term security in research. Lacking it today leads hundreds of scientists to go into practice, into industrial work, or to reduce time given to research and hence research results.

The effect of this research development cannot be fully appraised for many years; however, its immediate effect is arresting. One dean writes,

"Probably for the first time in 126 years of its history, it is reasonable to state that an active research program is in progress in every division of the Medical School."

That situation repeated many times in our region is bound to have a beneficial ultimate cumulative effect. This effect is several-fold: on institutional morale, on the development of added research personnel, on the favorable recruitment of teachers and researchers, on the sum total of research results, and on students, our first concern.

Another dean has this to say in this regard,

"This (research) trend has had a very excellent effect upon the teaching of students and the development of young graduate students, many of whom are working on research projects. Several men have, of course, become so interested in previously unknown interests in research that they have decided to pursue research and teaching as their life's work."

This situation, as you well know, is duplicated over and over again in our institutions.

One of my old teachers used to say to us as youngsters that there is no substitute for the enthusiasm, competence, and caution that come with discovery, regardless of kind, and these attributes carry over into the classroom, the laboratories, and the clinic. He believed these research results were as important as additions to knowledge. His conclusions have been confirmed by my own observations over many years, but the public and perhaps the people who make the research funds available from taxes or as gifts, may need more education before they understand the broad advantages of research; and now we come to the difficult question as to how the multiplying research funds of the past five years are to be continued and increased.

The case for research must be carried to the public wherever it is. One dean ventured the view in his report,

"I feel that sources of local support for research in our medical schools in the South are available if we stimulate interest. It is up to us to stimulate this interest and demonstrate the value of research in terms of health and welfare."

The pertinence of this statement lies in the success of its author in securing local funds for research.

Somebody has said that research is "guerilla warfare against the unknown." The public knows that warfare always costs and has hazards, and so has research; the public knows less of research costs and hazards, however. These hazards have sometimes been deterrents. Those especially gifted in research are not sufficient to go around. A good deal of work, therefore, has been done in the name of research at the hands of the less competent; this may have set it back at points. Further, it is not always realized that research is unpredictable. It must, therefore, be viewed on a long-range basis, and in the hands of the competent. On this basis it pays big dividends. Those who support it must understand the failures and look to the inevitable worthy results which are certain to follow when there is patience aplenty, and backing for able investigators. When the potentialities of research are viewed in perspective substantial backing is likely to eventuate.

What can research be expected to do, asks the onlooker. One of the first results of research is increase in trained personnel. For such personnel there is no substitute in plans or money. One reason we are short on research personnel can be traced directly to the lack of research support in our colleges, universities, and research institutes. It is fair to suggest that those who support research whether taxpayers or other individuals and corporations, must find a fair measure of dividends in better prepared research personnel. Some of these, too, may never do a

day's work in a research laboratory after they have mastered some of the tools of research and shown perhaps even a high degree of aptitude. A good many of them will reach places in top administration or management. To their positions they will bring fruitful curiosity, imagination, trained observation and analysis, proper caution in drawing conclusions, drive, and many of the other attitudes and characteristics found indispensable to research. Certainly administration and management can profit by those who know what research is and can approach their problems with research outlook and understanding. I personally know administrators who regularly approach their responsibilities in the spirit of research and thus become creative instead of routine administrators. One often thinks that many activities in almost every field of endeavor suffer because of non-research attitudes too persistently maintained.

However, some of those trained research personnel will continue in research and pay off in basic and applied research. A sound and able research worker, the public should know, is a priceless asset, so priceless that a corporation may buy another organization, plant and all, just for its research team. Sometimes the able researcher has enough ideas to keep a score of assistants busy, sometimes at feverish pace. He is so priceless that he should be given more freedom than most of the other individuals in the organization. Sometimes his inspiration, or whatever it is that keeps him going, will seem to peter out but he will generally renew it by visits to colleagues, to an outlandish place maybe to be alone and there to dream, to the theatre, to church, to the haunts of men, or to the waste places of the earth, in one or many of these places, to renew himself, to rekindle the ideas and the faith necessary for tomorrow's work. Mere money will not buy these top people; they must be paid certainly but they must be recognized and appreciated as well.

Another expectation of research is to increase our *firsts* and our *bests*. Increasing the number of *bests* in the South, a *best* department in a medical school, a *best* anything, just so it is a *best*. These *bests* will raise morale, wipe out inferiority complexes, and hold more *best* minds in the South, always needed. If we could get every leader of the region in medicine, in business, in education, in industry, in religion, in every sphere of human endeavor, to resolve individually and unitedly to dedicate himself to more *bests* in the South, measured against the nation and the world, soon there would be many more of them in our midst.

After referring the public to research as a source of personnel and a fair share of *bests*, we can point to its salutary effect on teaching, on students and staff as a whole, and easier staff recruitment. Then we may portray research results, what some communities, states, and individuals have done to advance research. All of these examples need not come from medicine alone.

Here follow three southern case histories from the deans' reports. They made good examples for education:

(1) "In August, 1946, the Oklahoma Medical Research Foundation was chartered as a charitable, nonprofit organization, affiliated with the University of Oklahoma School of Medicine. Over a period of four years over 7,000 individuals pledged $3,300,000 to this Foundation. A three-story Research Institute building, containing the finest research facilities, has been constructed adjacent to the School of Medicine, together with a 24-bed research hospital. A highly qualified scientific staff has been appointed. A broad program of research has been started in oncology, cardiology, metabolic disorders, and basic medical sciences. Oklahoma is seriously attempting to foster medical research in the Southwest. The effort is perhaps unusual in that it has the interest and active support of a large number of individual citizens. Members of the faculty of the School of Medicine were active in the conception of the program; they planned the facilities of the Institute; they participated actively in the fund-raising campaign; and they are cooperating on research projects in the Institute. Members of the Institute staff have academic appointments in the School of Medicine. Faculty members are consultants to the Research Foundation in their specialties. The two institutions share property, facilities, and personnel."

(2) "At the close of the war, when our staff reassembled and prepared to return to its peacetime activities, it was apparent at Louisvile that a serious shortage existed in personnel and facilities for research. This was particularly distressing in view of the availability of funds in support of research to those institutions which could use them profitably with existing facilities. Inquiry revealed that only one or two departments in our school had sufficient permanent staff, and adequate facilities, to employ outside grants in aid of research.

"Two major steps have been taken to correct this situation. Four years ago the University authorized the creation of the University of Louisville Institute for Medical Research, separately incorporated by the State of Kentucky, for the single purpose of facilitating research. Local funds were obtained amounting to $100,000, with which two laboratories were constructed and equipped for studies of hospital patients and normal subjects. More recently, for the past three years, the State of Kentucky has undertaken a partial subsidy of research in the Medical School, to the extent of $125,000

annually. The state funds were allotted to the Medical School by a Research Commission, appointed by the Governor, with authority to award contracts for medical research. The terms of the contracts have been quite liberal, and have resulted in no restrictions on our research activities. Louisville, of course, has also had other research funds."

(3) "Research at the University of Texas Medical Branch in Galveston has been enormously accelerated since World War II and has been closely integrated into the teaching and service program. A series of twelve special research laboratories has been established, with legislative support. These form an organizational basis for continued research in such selected fields as experimental medicine, experimental surgery, cardiovascular disease, tissue culture studies, general microbiology, hematology, malaria, virus diseases, rickettsial diseases, industrial toxicity, helminthology, tissue metabolism, and medical physics. Each of these research laboratories is under the direction of a qualified member of the staff and has budgetary provision for technical assistants and supplies. These organized research laboratories are extremely helpful in providing confidence for satisfactory research cooperation from private and public agencies who are interested in giving grants to the Medical Branch for the support of research. The State Legislature has appropriated approximately $50,000 a year to support research, while grants from public and private sources total more than $400,000 annually.

"Significant research developments at the Medical Branch have been closely correlated with these special research laboratories, and with departmental laboratories."

It is regretted that detailed accounts of specific research projects cannot be given here department by department, although many such details were given in the reports received. Also, I wish it were possible to state categorically that the quality of our now increased research matches its quantity. We shall leave that for time to settle. Rather, we are attempting an over-view of the field.

This has confirmed the conviction, already plaguing, that we may wake up one fine day to learn that Congress has not renewed its research appropriations in sufficient amounts to go around as formerly. Meantime, are we building up local and regional reserves and support to cope with such a crisis, a near catastrophe? Some centers are doing it; others need to do more educational work, taking the public into confidence, creating local medical school research foundations where advisable, and doing a multitude of other things to cultivate and secure research money.

Maybe a self-appointed committee, or a committee of this Section of the Southern Medical Association, could meet to survey all possible fund raising procedures and share its work with all the rest of us.

ACTH AND CORTISONE*

THEIR ROLE IN DERMATOLOGIC THERAPY

By J. LAMAR CALLAWAY, M.D.
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The physiology of ACTH and cortisone is well established. The mechanism of action of these hormones in diseases which affect mesenchymal tissue and other tissues is not clearly understood. It is almost impossible to predict what disease processes may be affected favorably. This discussion is based on a review of published data, personal communications, and personal experience. An attempt will be made to summarize in general terms the present place of ACTH and cortisone in dermatologic therapy.

For a more fundamental discussion of ACTH and cortisone, the proceedings of the first and second clinical ACTH conferences should be read carefully.[1,2]

One must remember from the outset that ACTH and cortisone cure nothing. Administration of either one or both preparations to patients with acute or chronic diseases may result in partial to complete remission in the clinical disease process without influencing the etiologic agents. Diseases which are self-limited are more favorably influenced. Strangely enough, for such potent therapeutic remedies, contraindications to their use are more clear-cut than the indications. Although there are times when the disease process in question may outweigh some of the conditions listed as relative or absolute contraindications for ACTH or cortisone therapy, in general the following conditions must be considered as relative or absolute contraindications to the use of these preparations.

CONTRAINDICATIONS

(1) Hypertension
(2) Impaired renal function
(3) Tuberculosis and other infections
(4) Personality disorders
(5) Cushing syndrome
(6) Impaired cardiac reserve (except rheumatic)
(7) Polycythemia
(8) Osteoporosis
(9) Peptic ulcer
(10) Diabetes mellitus
(11) Adreno-genital syndrome (ACTH contraindicated, cortisone helpful)

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*Chairman's Address, Section on Dermatology and Syphilology, Southern Medical Association, Forty-Fifth Annual Meeting, Dallas, Texas, November 5-8, 1951.

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ACTH and Cortisone Usually Helpful.—There are a number of conditions in which ACTH and cortisone are usually helpful, particularly the hypersensitive states in which there is an antigen-antibody reaction and in which the disease itself is usually self-limited. Hypersensitive states that develop as a result of drug eruptions and which commonly run a limited course respond as a rule dramatically, as do most cases of urticaria with the exception of solar urticaria. Acute contact dermatitis, acute erythema multiforme, and angioneurotic edema are also processes which usually respond well to ACTH or cortisone. Acute atopic eczema may be helped, but ACTH or cortisone is not recommended for routine use in atopic eczema. When both the patient and physician are frantic with an acute problem that has not responded to conservative therapy, ACTH or cortisone may be helpful in getting the patient under immediate control.

As mentioned before, although ACTH and cortisone cure nothing, it appears that acute disseminated lupus erythematosus, pemphigus, erythema nodosum, and some types of exfoliative dermatitis, chiefly those due to drugs, are helped by the use of ACTH and cortisone.

ACTH and Cortisone Temporarily or Partially Beneficial.—If one reviews the literature to date, one will find contradicting statements as to the effectiveness of ACTH and cortisone in a number of cutaneous disorders and it appears that ACTH and/or cortisone are at least temporarily beneficial in lichen planus, scleroderma, some acute types of psoriasis, dermatitis herpetiformis, and the exudative discoid and lichenoid chronic dermatosis of Sulzberger. There are many other favorable reports about varying dermatoses, but on the basis of published data, the above list seems to be representative.

ACTH and Cortisone of Little Value.—In our experience, and on the basis of published data it appears that ACTH and cortisone are of little or no value in mycosis fungoides, and other cutaneous lymphoblastomas, the viral diseases in general, solar urticaria, acanthosis nigricans and dermatomyositis. The latter condition is somewhat controversial, but in our experience, little permanent benefit has been obtained.

ACTH and Cortisone Locally.—ACTH or cortisone locally is useless except in interstitial keratitis, and other allergic eye conditions in which locally applied solutions of cortisone are invaluable.

ACTH and Cortisone Dosage.—It is difficult to recommend any uniform dosage schedule for ACTH or cortisone for the dosage depends on the individual patient's response which can best be followed by routine eosinophil counts, but in general one may begin with 20 units of ACTH intramuscularly every four to eight hours. If the patient is resistant to treatment, the administration of ACTH intravenously in a dosage of 10-20 units over an 8-24 hour period may be used. This mode of therapy also decreases cost of treatment. The longer each intravenous drip is used, the more efficacious is the treatment. Cortisone may be given intramuscularly in a dosage of 50 to 200 mg. daily or orally in a dosage of 25 to 50 mg. every six to eight hours. It is important to seek the lowest effective dose and withdraw medication slowly unless only a short course of treatment has been required. If kidney function is normal, the patient should eat a low sodium diet and take potassium chloride three to six grams daily.

Minimal Studies Before Therapy.—The minimal work-up before ACTH or cortisone therapy should include a complete physical examination with blood pressure determinations, urinalysis, and roentgenogram of the chest. Hospitalization is desirable to get treatment started. A complete blood count, differential, erythrocyte sedimentation rate, hematocrit, electrocardiogram, blood carbon dioxide, chlorides, potassium, and eosinophil counts are extremely helpful and desirable and should be obtained if possible.

Untoward Reactions.—The signs and symptoms of ACTH or cortisone intolerance include the development of a moon face, acne, hirsutism, glycosuria, or edema, which are disturbing, but do not necessarily indicate that therapy must be discontinued. However, the development of hypertension, psychosis, hypochloremia, hypokaliemic alkalosis, intestinal perforation, activation or spread of infection, severe headache, convulsions, or acute pulmonary edema require immediate cessation of therapy.

Routine Minimal Studies During Therapy.—The routine minimal guide during therapy should include urinalysis, blood pressure, determinations and weight at least twice weekly, and later on after the patient is on a maintenance dose, as an ambulatory patient, weight, blood pressure, and urinalysis can be carried out weekly. Headaches, weakness, edema, or other signs of intolerance require complete re-evaluation.

SUMMARY

ACTH and cortisone are most helpful in the hypersensitive state in which the disease process itself is self-limited. ACTH and cortisone are indicated in the more severe conditions such as acute disseminated lupus erythematosus, pemphigus, and exfoliative dermatitis. They may be helpful in lichen planus, scleroderma, some acute forms of psoriasis, dermatitis herpetiformis, exudative discoid and lichenoid chronic dermatosis of Sulzberger, and possibly dermatomyositis. It is recommended in acute atopic eczema only in instances in which the patient is in a precarious condition, and not for routine use. The local use of ACTH and cortisone is of no value except for interstitial keratitis and other allergic eye conditions.

Contraindications, routine pre-treatment studies, signs of intolerance and minimal studies during therapy are outlined.

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THE VALUE OF ACTH AND CORTISONE IN OCULAR INFLAMMATIONS*

A PRELIMINARY REPORT

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During the past year two new therapeutic agents, ACTH (adrenocorticotropic hormone) and cortisone, have been introduced for the treatment of ocular inflammations. This preliminary report deals with their evaluation as determined by clinical observation. No experimental work is included. Because of the short period over which these patients have been followed, it is impossible to come to extensive conclusions. Your attention is called to similar reports by Gordon and McLean,[1] Henderson and Hollenhorst,[2] Spies and Stone,[3] Woods[4] and others,[5 6 7] which have been or soon will be published. The patients whose cases are reported here were under the care of certain members of the staff of the Department of Ophthalmology of Vanderbilt University Hospital.

*Read in Section on Ophthalmology and Otolaryngology, Southern Medical Association, Forty-Fourth Annual Meeting, St. Louis, Missouri, November 13-16, 1950.

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ACTH

ACTH is a hormone derived from the anterior lobe of the pituitary gland. The commercial supply is obtained from the pituitary gland of animals. The chemical structure is a complex protein and for this reason has not as yet been synthesized. It is called adrenocorticotropic hormone or ACTH because of its effect upon the cells of the adrenal cortex, resulting in production of three groups of steroid hormones. Some of these compounds, one of which is cortisone, modify the eye's response to inflammatory stimuli.

The adrenal hormones have effects which are extremely important when one is considering the use of ACTH in treatment. The first group influences the metabolism of carbohydrate, protein and fat. This must be considered in diabetic patients. The second group alters the balance of sodium and other electrolytes which may result in fluid retention. This is important in patients with hypertensive, cardiac or nephritic disease. The third group has an androgenic or masculinizing effect, which is not frequently manifested under ordinary dosage.

It should also be known that the administration of ACTH depresses the secretion of ACTH from the patient's own pituitary gland. If the parenteral supply is suddenly terminated, symptoms may result due to lack of the hormone.

The exact mode of action of the steroids stimulated to production by ACTH is not known. It is possible that they interfere directly in the chemical reactions of the individual tissue cell. They seem to protect the cell from various harmful stimuli. The objective signs of inflammation such as fever, pain, redness, outpouring of inflammatory cells and fibrin are inhibited. The fibroblastic response is thus reduced. There may also be an alteration in the central nervous system. Euphoria is frequent. Excessive stimulation may cause psychotic manifestations such as depression.

CORTISONE

Cortisone is a hormone of the adrenal cortex. The therapeutic preparation is synthesized into a crystalline pure compound. What has been said concerning the effects of the steroids whose production is stimulated by ACTH, must also be considered in the use of cortisone. Alteration in carbohydrate, protein and fat metabolism, disturbance of electrolyte balance, creation of mental

aberrations and interference with the equilibrium of the sexual characteristics are known to occur. The response with cortisone is more predictable than with ACTH because it acts directly.

Methods of Administration.—ACTH is supplied as a powder to be dissolved in saline for parenteral use. Because of its widespread systemic effect, it is the policy of our hospital for the patient to be under the careful observation of the medical or pediatric departments and for the dosage to be determined by them in collaboration with the ophthalmologist.

It is usually given in divided doses at least every six hours. The initial daily dose for adults should be small, probably not over 50 mg. in order to observe the clinical response and evidence of abnormal reactions. Daily amounts exceeding 100 mg. are not advocated. The amount should be gradually reduced before cessation of treatment.

Cortisone is crystalline and is supplied in a saline suspension of 25 mg. per cc. for parenteral use. For topical application this may be diluted with saline, or the crystals may be combined with an ointment base.

If it is to be given parenterally, the patient is hospitalized and the responsibility is shared by the medical or pediatric departments. However, if cortisone is to be used locally in dilute concentration, we feel that this is not necessary.

Contrary to the parenteral administration of ACTH, cortisone is given in relatively high initial daily doses with a lower level of maintenance concentration quickly determined. It need not be given so frequently, as it is more slowly absorbed from the site of injection. In adults, 300 mg. may be used on the first day with a maintenance daily dose of 100 mg. It should be withdrawn gradually before stopping treatment.

Before attempting to use these hormones in treatment, much more should be known about the dosage schedule and effects than can be written here. Their use is highly dangerous and should not be attempted without a previous medical survey of the patient's general health by a physician aware of the potentialities of these agents.

At the present time, the topical application of cortisone is believed to be less hazardous. There is apparently no great systemic concentration obtained. Local irritation has been reported, but in our cases this did not occur. Subconjunctival injections of undiluted cortisone have been used elsewhere and adverse local tissue reactions have been noted in some patients.

We have used only the local instillation of drops of cortisone. It was prepared in a dilution of saline, 1 part cortisone and 4 parts saline. This provided a concentration of 5 mg. per cc. We have used it every thirty minutes initially, then reduced the frequency to every hour, every three hours, three times a day and finally once daily before stopping. We have some patients who showed recurrence of inflammation when the medication was terminated. These have been placed on a daily dose to be used for an indefinite period of time. What the result of this will be is yet to be determined. There are patients who I am sure would otherwise be blind if they were not receiving it.

VALUE IN EXTRA-OCULAR INFLAMMATIONS

Five patients with external inflammations were treated (*Table 1*). Two patients received no benefit. One of these, with vernal conjunctivitis of one year's duration, had been previously treated with x-ray and beta ray therapy. The other patient, with Sjogren's syndrome, was observed while receiving cortisone for rheumatoid arthritis. Repeated measurements of the tear production by the Schirmer test, as well as by direct examination of the eyes and by the patient's symptoms, gave no indication of improvement in function of the lacrimal gland. It was necessary to keep artificial tears on the cornea to prevent denudation of the epithelium.

Three patients showed definite improvement. The first was suffering from a fourth recurrence

EXTRA-OCULAR INFLAMMATIONS

Diagnosis	Patient	Method of Treatment	Result
Vernal conjunctivitis	Male age 7	Cortisone local	No improvement
Keratitis sicca (Sjogren's syndrome)	Female age 58	Cortisone intramuscular	Schirmer test time, keratitis unaffected
Dendritic keratitis	Female age 16	Cortisone local	Inflammation subsided in 3 days
Marginal stromal keratitis	Female age 23	Cortisone intramuscular	Inflammation subsided in 3 days
Interstitial keratitis (syphilitic)	Male age 12	ACTH intramuscular cortisone intramuscular cortisone local	Inflammation subsided, cornea cleared

TABLE 1

of dendritic keratitis. The present episode was treated for eight days with aureomycin. This was followed by iodine cauterization. Seven days later no improvement had been noted and the instillation of local cortisone was begun. In three days the active inflammation had subsided. In one week the eye showed only the previously existing opacity.

The second patient had a marginal stromal infiltrative keratitis of one month's duration. An etiologic diagnosis was not determined. A positive brucellergin test was found, but there was no evidence of active brucella infection. This patient was treated with atropine and aureomycin for ten days without improvement. Local use of cortisone brought relief of pain and redness in five hours and complete return to normal in three days. No stromal infiltration persisted.

The third patient had had bilateral acute syphilitic interstitial keratitis for one month. He had had a course of penicillin completed two weeks prior to admission, without relief from ocular symptoms. This patient obtained dramatic relief from pain and photophobia with improvement in vision upon clearing of the dense stromal infiltration. His initial response was to ACTH. The recurrence upon cessation of ACTH was quickly controlled by parenteral cortisone and maintained by local cortisone.

No final conclusions can be made from observation of these few patients. The failure in treatment of vernal conjunctivitis might have been due to the dense character of the granulations which had been irradiated. Perhaps the penetration would have been greater from parenteral than from local administration. Replacement of glandular tissue by fibrous tissue would be expected in the lacrimal gland of the patient with keratitis sicca. In such cases, an increased flow of tears would not be anticipated.

The three patients who responded do show some similarity. They were suffering from active inflammation of short duration in which there had been relatively little permanent destructive tissue changes. They showed hyperemia and infiltration of inflammatory cells into ocular tissues. The hormones, whether they reached the tissue cells endogenously or exogenously, rapidly blocked this inflammatory response. Allergy was probably a factor in the onset of inflammation in each case. Even with virus infection present in dendritic keratitis, Thygeson has pointed out the hypersensitivity of corneal cells developed by repeated infection. One might therefore believe that ACTH and cortisone interfere with the chemical response initiated in the cell by the allergen, whether of virus, bacterial or spirochetal origin. It apparently is a transient interference, as indicated by the recurrence of inflammation upon cessation of treatment for the patient with interstitial keratitis. However, the blocking effect does purchase the time during which no further destructive change occurs, and during which either the concentration of allergen is reduced or the patient's own immunity is increased. In the eye this can mean the difference between sight and blindness. All of us know that many of these inflammations will subside if enough time elapses, but all too frequently there is irreversible replacement of normally transparent structures by optically opaque fibrous tissue.

Value in Intra-ocular Inflammations.—Nine patients with intra-ocular inflammations were treated (*Table 2*). Two showed improvement but with some limitations. Both suffered from recent uveitis complicating cataract extraction which had been performed over a year previously. Cortisone controlled the ciliary injection and infiltration of cells in the aqueous. However, in one the intra-ocular pressure increased while using topical cortisone in spite of absence of signs of active inflammation. The other patient's

INTRA-OCULAR INFLAMMATIONS

Diagnosis	Patient	Method of Treatment	Result
Chronic uveitis, complicating aphakia	Male age 43	Cortisone local	Inflammation subsided, recurrences controlled
Chronic uveitis, complicating aphakia	Male age 42	Cortisone local cortisone intramuscular	Inflammation subsided
Chronic iridocyclitis	Male age 45	ACTH intramuscular	Incomplete clearing of vitreous opacities
Chronic uveitis	Female age 36	Cortisone local	Incomplete clearing of vitreous opacities
Acute iridocyclitis	Male age 29	Cortisone intramuscular	Inflammation subsided in 3 days
Chronic iridocyclitis	Female age 54	Cortisone local	Inflammation subsided in 3 days
Chronic iridocyclitis, secondary glaucoma	Female age 58	ACTH intramuscular cortisone local	Inflammation subsided in 24 hours, recurrence controlled
Acute choroiditis	Male age 38	ACTH intramuscular	Inflammation subsided, residual macular atrophy
Optic neuritis	Male age 41	Cortisone intramuscular	Inflammation subsided

TABLE 2

corneal stroma became opaque. Whether or not cortisone played a part in the onset of these two complications will remain to be seen.

Improvement was manifested in two of these nine cases by reduction of vitreous opacity with resultant increase in vision. The signs of anterior ocular segment inflammation were controlled.

The remaining five patients had good to excellent results from the treatment. The active inflammation was rapidly controlled in three patients suffering from recurrent nongranulomatous uveitis. Another, with recurrent uveitis and secondary glaucoma, suspected of being sympathetic in origin, was freed of symptoms and signs of activity. In the remaining patient, optic neuritis responded favorably to the administration of parenteral cortisone. Edema of the disc was notably diminished in four days, with improvement in vision. By the sixteenth day the fundus appeared entirely normal.

What has been said regarding the general response of external inflammations can also be applied to those of the intra-ocular structures. If by early treatment and control of acute recurrent uveitis, we can prevent atrophy of the iris, formation of synechiae, complicating cataract, pupillary membrane, hypotony and other accompaniments, a tremendous step in the prevention of blindness will occur. Likewise, if we can deactivate early inflammation of the posterior segment, we may be able to preserve large areas of functioning choroid and retina. Alvaro and many others have emphasized the fact that if we can confine the early edematous and infiltrative phase in acute choroiditis to a small area, we may prevent a peripheral or paramacular lesion from extending into the macular region and interfering with central vision. For this reason, it is my opinion that the possibility of using these hormones should be considered in every patient with acute posterior uveitis. If used immediately, they might tend to minimize the destructive phase of this inflammation.

REPORT OF CASES

EXTRA-OCULAR INFLAMMATIONS

Case 1.—This patient was a 7-year-old boy who had had severe signs of bilateral vernal conjunctivitis for one year. He had received x-ray and beta ray therapy without improvement. He was found to be sensitive to Staphylococcus toxin, but a trial at desensitization with Staphylococcus toxoid made him worse. He was placed on local instillation of cortisone every two hours. After one week there was no change and it was discontinued. Parenteral administration was not attempted.

Case 2.—Keratitis sicca (Sjogren's syndrome). This patient was a 58-year-old woman who had been repeatedly hospitalized for treatment of rheumatoid arthritis. She had been using artificial tears for five months prior to the present admission. She was given 450 mg. of cortisone parenterally over a five-day period before it was temporarily discontinued because of "nervousness." Treatment was reinstituted and a satisfactory response for her arthritis was obtained. Repeated Schirmer tests were performed before and during her treatment. They had previously varied from 3 to 5 mm. and showed no alteration while receiving cortisone. When the epithelium of the cornea began to desquamate, Gifford's tear solution was reordered.

Case 3.—This patient was a 16-year-old girl who was seen on the third day of the fourth recurrence of dendritic keratitis of the left eye. Her first episode was in 1938. She was placed on local instillation of aureomycin and atropine. This was discontinued after no improvement was noted in eight days. At this time the cornea was cauterized with iodine but after seven days the keratitis remained active. Cortisone drops were then ordered to be used every hour. In three days the symptoms and signs of inflammation had subsided. The medication was continued for sixteen more days before being discontinued.

Case 4.—This patient was a 23-year-old woman who complained of symptoms of marginal stromal keratitis which had persisted for one month. There was a stromal infiltration without ulceration extending centrally for 3 mm. at the lower nasal limbus. A superficial diffuse corneal opacity was noted near the upper limbus. No evidence of blepharitis or conjunctivitis was found. A survey of her general health was normal. She had a positive brucellergin test but no active infection. The initial treatment of atropine and aureomycin was discontinued after ten days because there had been no improvement. Local cortisone instillations were ordered and in five hours the pain and redness had gone. On the third day the stromal infiltration had completely cleared. The medication was stopped. No recurrence has been noted.

Case 5.—This patient was a 12-year-old boy who was admitted because of ocular pain and blurred vision of one month's duration. He had been found to have syphilitic interstitial keratitis at another hospital and had received 4,640,000 units of penicillin. There was no objective change in his ocular status. At first examination, vision in the right eye was reduced to light perception; in the left eye it was 20/100. There was bilateral active diffuse interstitial keratitis. He was admitted to the Pediatrics Service. After thorough examination ACTH was administered beginning with 12.5 mg. every six hours. After eighteen hours of treatment the patient noted subjective relief and was able to open his eyes. In ten days the slit-lamp examination revealed peripheral clearing of the stromal infiltration. By the eighteenth day the right cornea had almost completely cleared while the left cornea was clear except for a central area of about 3 mm. There was no discomfort. Vision improved to 20/40 in the right eye and 20/50 in the left eye. He received ACTH for twenty-six days. Twenty days after cessation of ACTH, symptoms of photophobia recurred and he was immediately given

cortisone parenterally every other day. On the fourth day the symptoms had subsided but the injections were continued nine days. Cortisone by instillation was employed for thirty-seven days and the treatment stopped. His corrected vision was 20/30 in the right eye; 20/50 in the left eye.

INTRA-OCULAR INFLAMMATIONS

Case 1.—Chronic uveitis, complicating aphakia. This patient, a 43-year-old man was first examined because of symptoms of bilateral blurred vision. Diagnosis of uncomplicated cortical cataract was made. Extracapsular extraction with peripheral iridotomy was performed on the right eye. Three months later mild uveitis occurred. He received local and foreign protein therapy with temporary relief. Local cortisone was ordered. The pain, ciliary injection and presence of aqueous cells subsided in five hours. Transient blurring recurred when the treatment was stopped. On the third week, following the use of cortisone, the intra-ocular pressure was first found to be elevated to 31 mm. Foreign protein was ordered and in forty-eight hours the pressure was normal. He remains on these two drugs and is free of symptoms.

Case 2.—Chronic uveitis, complicating aphakia. This 42-year-old man developed failing vision at the age of 34. Combined extracapsular cataract extraction of the right eye was performed at the age of 39. One year later, discission was necessary. This was followed in a year by combined extracapsular extraction of the left eye. He maintained 20/20 vision in both eyes for two years at which time he returned with a mild uveitis in the right eye. The usual local medications were of no value. He was admitted for investigation and treatment. Nothing contributory was found and he was placed on local cortisone, with no improvement. Cortisone was then given by parenteral administration for one week and he was dismissed to use it again locally. The symptoms were relieved and active inflammation subsided. It has been noted that the corneal stroma became opaque. The intra-ocular pressure has been normal.

Case 3.—Chronic iridocyclitis. This patient was a 45-year-old man who had suffered from nongranulomatous recurrent uveitis associated with severe rheumatoid arthritis since 1938. He was given ACTH for twenty-six days. A moderate amount of fluid retention occurred which disappeared on cessation of treatment. All evidence of active inflammation subsided and the dense vitreous opacities cleared, permitting the entire fundus to be examined. There were no choroidal lesions found. Vision improved from ability to perceive moving objects to 20/70 in both eyes.

Case 4.—Chronic uveitis. This patient was a 36-year-old woman whose vision in the right eye had been poor light perception for three months at the time of her first visit. She had had a similar but less severe episode five years previously. A diagnosis of chronic granulomatous uveitis was made although all results of tests for the suspected organisms were negative. She had received the recognized forms of treatment with very slight improvement. The use of parenteral ACTH or cortisone was not feasible but local cortisone therapy was instituted. In six weeks the vision had improved to 2/400 and all evidence of active inflammation in the anterior segment of the eye had subsided.

Case 5.—Acute iridocyclitis. This patient was a 29-year-old man who had been suffering for twenty-four hours from his fourth recurrence of nongranulomatous anterior uveitis. This attack was characterized by intense cellular and fibrinous exudate and hemorrhage on the iris. He was given 100 mg. of cortisone parenterally for three days, at which time the signs of active inflammation had subsided. Treatment was discontinued because of mental depression. On the seventh day the patient's mental state and his eye were normal.

Case 6.—Chronic iridocyclitis. This patient was a 54-year-old woman who had had repeated recurrences of acute nongranulomatous uveitis in both eyes. These had ultimately resulted in a chronic uveitis with much destruction of the intra-ocular tissue and secondary glaucoma. She had received the accepted forms of treatment. Cortisone was ordered locally. Active inflammation subsided in three days including maintenance of normal intra-ocular pressure and freedom from pain. The atrophy and fibrous proliferation were unaffected.

Case 7.—Chronic iridocyclitis, secondary glaucoma. This 58-year-old woman had experienced sudden complete blindness in the right eye in January, 1948. Nine months later she developed pain and redness. A massive retinal hemorrhage with iridocyclitis and hypotony were present. Enucleation was refused. The left eye was normal. One year later she returned with vision in the left eye blurred. Large translucent precipitates on the cornea were found. Sympathetic uveitis was suspected and enucleation of the blind eye was performed. The pathologic examination revealed a malignant melanoma and an endophthalmitis with eosinophilia. A chronic inflammatory cellular response was present but the microscopic evidence for a positive diagnosis of sympathetic uveitis was not felt to be sufficient.

The inflammation in the remaining eye continued and secondary glaucoma developed. This required surgical intervention but the pressure again became elevated after one month in spite of medication. ACTH was suggested and in twenty-four hours the vision had improved from perception of moving objects to 20/50 and the tension from 60 to 19 mm. Schiotz. Signs of active inflammation had subsided. No tumor was found. She received ACTH for fifteen days. One month after stopping treatment she returned with early evidence of recurrence of inflammation. Cortisone locally instilled controlled the inflammation in six hours. She has been maintained on this treatment for two and a half months. Her present vision is 20/30, J-2 and her tension 19 mm. Schiotz.

Case 8.—Acute choroiditis. This patient was a 38-year-old man who complained of blurred vision in the left eye six weeks prior to admission. He had had poor vision in his right eye since the age of sixteen because of macular choroiditis. An active choroiditis was found in the macular area of the left eye. This remained active in spite of the usual treatment. All etiologic tests were normal, except the tuberculin, which was positive. When ACTH became available eight months later, he was readmitted and this was administered for twenty-

six days. His vision improved from 3/400 to 20/80 after eight days. One month after beginning treatment the diffuse reaction in the macula had disappeared leaving a demarcated atrophic area.

Case 9.—Optic neuritis. This patient was a 41-year-old male who had noticed blurring of vision in the left eye for one week. Examination revealed an acute optic neuritis with edema and hemorrhage upon the disc. He was given 100 mg. cortisone for six days. In four days the edema was subsiding. By the sixteenth day the disc appeared normal and vision had returned to 20/15. The cause for the optic neuritis was not apparent.

SUMMARY

During the past year two new therapeutic agents, ACTH and cortisone have been introduced for the treatment of certain ocular inflammations. This preliminary report deals with their evaluation as determined by results in treatment of fourteen patients. The hormones were administered under the supervision of certain members of the staff of the Department of Ophthalmology at Vanderbilt University Hospital.

Systemic changes resulting from the use of ACTH and cortisone are reviewed. Methods of administration in the treatment of ocular inflammations are also considered.

Of five patients with external ocular inflammation who were treated, three received beneficial results, in spite of failure with other accepted forms of therapy.

Nine patients were treated for intra-ocular inflammatory disease. Results varied, depending upon the special characteristics of the patient's illness, but all showed improvement.

The apparent value of these new methods of treatment seems to lie in their ability to prevent the usual pathologic response to inflammatory stimuli. This is of unusual importance in the eye because of the peculiar necessity of the organ to avoid scar formation in order to preserve its normal function. A healed scar in the line of vision interferes with the optical properties of the eye. If these agents will shorten the course and confine the limits of inflammation, they may prove to be of exceptional value in the preservation of vision.

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DISCUSSION (*Abstract*)

Dr. Albert E. Meisenbach, Dallas, Tex.—Has Dr. Lawrence had experience in the use of this in dystrophy or in glaucoma from secondary uveitis?

Dr. Lawrence (closing).—We have had no experience treating patients with ocular dystrophy with either ACTH or cortisone. Two of the cases reported in the group of intra-ocular inflammations, *Cases 6* and *7*, had glaucoma associated with uveitis. Both of these were extreme cases whose increased pressure did not respond to usual medical treatment. One patient had required repeated paracentesis and the other had had a trephining and iridectomy performed without permanent reduction in pressure.

The local instillation of cortisone controlled the secondary glaucoma in *Case 6* and ACTH and later topical cortisone controlled it in *Case 7*. The response in both patients was rapid, lowering the pressure to normal in less than 24 hours. Both patients are using cortisone drops as maintenance therapy.

Dr. Meisenbach.—Have you used it at all in punctuate keratitis?

Dr. Lawrence.—We have not at present treated any patients with this type of inflammation.

SOME ASPECTS OF NEGATIVISTIC PHENOMENA*

By HUNTER P. HARRIS, JR., M.D.
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The term negativism has long been used in psychiatry as a designation for variable uncooperative, resistant, or defiant behavior. Perhaps the most familiar and correct usage of the term is to describe the behavior of some psychotics, particularly that of the catatonic schizophrenic who in a most determined fashion resists everything that one would do for him or have him do. More loosely, the use of the term is heard to describe various kinds of uncooperativeness, such as the disobedience of children, temper tantrums, or even the failure of an obese adult patient to conform to a diet. There is a tendency

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for the loose usage of the term to be an unenlightened one. In this case there is the implication that the patient is consciously deliberate about his negativism and an attitude of dislike is taken by the physician toward him. Thus he may be considered bad, immoral, or just weak and lacking in will power. This was clearly exemplified during the last war when so many soldiers who went A.W.O.L., were defiant of authority, or violated Army regulations, were labelled psychopathic personalities with far too little attention being paid to the often devastating mental conflict and resultant anxiety which the soldier was attempting to handle in this way. "'Psychopathic personality" is widely associated with misbehavior, immorality or simply "inherently bad stock." Among psychiatrists the expression "negative transference" is often heard. This too often implies that the patient is not cooperating in his treatment or is expressing hostility. No doubt this is so, but negativism more appropriately should be spoken of as resistance in therapy. It can safely be assumed that when a patient consults a physician he has some problem which he needs help in solving. Therefore, it is not sufficient simply to say that the patient is resistant to therapy or negativistic toward the therapist. The resistances always represent expressions of psychological defense mechanisms characteristic of either the patient or the physician-patient relationship. Resistances can and must be recognized and utilized to further the therapy of the patient.

It is the purpose here to apply psychological understandings and principles to explain some of the reasons why patients are resistant or fail in various ways to cooperate for treatment. There are examples of this too innumerable to mention, but for illustration think of the orthopedic patient who neglects to wear his brace or foregoes prescribed exercises, or the surgical patient who has a prolonged convalescence without apparent reason despite his doctor's reassurance, or the internist's patient who assumes that if one tablet be the dose three must be the cure. That this is often the case depends not just on the fact that most patients present a varying combination of both emotional and physical troubles, but on the very nature of man's psychology and its development.

Physical and mental growth of the infant depends upon gratification of its instinctive needs. The energy within the infant which motivates him to seek the satisfaction of his needs stems from instincts. The infant's strivings for gratification are dominated by a pleasure-pain principle which means he must constantly seek whatever it takes to feel comfortable and happy, and try to avoid that which is uncomfortable or unpleasant. In addition to the need for gratifying his purely physical well being, the infant must gratify his emotional needs through obtaining love and, through this, its self esteem. Associated with the latter process are erotic needs which are simply the earliest developmental phases of what later is to become the adult's sexual life. Thus we speak of oral erotic, anal erotic and genital phases of development. In order to gain love of the mother the infant begins in accordance with pleasure-pain principle to give up a portion of its self-centeredness. This happens only in its reality world at first, and for a long time the infant retains fantasies of omnipotence, wishing he had the power to gratify at will and immediately all the various needs which his instincts determine. Since it is not possible for all the needs of the infant to be met, or if so, not immediately, the pain and discomfort encountered, with frustration, results in rage. Examples of frustration of instinctive striving are seen in weaning, toilet training, and prohibition of masturbation. Enraged feelings give rise to fear and anxiety due to the fact that early fantasies of hostility tend to be extremely sadistic in nature. The child fears the consequences of his sadistic and often associated sexual strivings. He fears punishment or loss of love. Therefore he represses his sadistic aims or sublimates them in ways which will make them acceptable to the grown-ups to whom he looks for gratification of love. In this process, certain concepts of what is acceptable or what is not, what is right and what is wrong, are incorporated into the personality and this forms a part of the conscience or super ego. When these concepts have been strengthened with attendant frustration of the child, the super ego has necessarily to be equally strict, binding, punishing and inhibiting, or more so than the impulses within, in order to keep the antisocial impulses at bay. Whenever the struggle between the instinctive drives and the controlling forces becomes intensified, a variety of psychic mechanisms of defense is brought into play.

Among these mechanisms for example are denial, reaction formation, projection and masochism. In masochism, for instance, we con-

sistently find, among other things, a defense in which the primitive instinctive impulses are denied to the point of actual reversal; that is, in this form of defense we prefer to accept punishment rather than to fear unknown consequences of primitive hostile impulses.

Every human being has to go through a process on the road to maturity, characterized by the adoption of the reality principle. This means an ability to forego immediate gratification for future gain or for the interest of group security, or it means a tolerance for reasonable amounts of frustration, anxiety, or hostility from others. It should not be hard to see that few people, if any, get through this developmental process without some eccentricities, peculiarities, and distortions in their emotional relationship to others, or interference with their effectiveness either through these mechanisms or through psychosomatic disease.

Unconscious forces displayed in positive attitudes toward our fellow beings, like sexual, social and friendly feelings and impulses, need not concern us except when they mask underlying hostility. Attitudes like aversion, fear, hate, disgust, flight, quarrelsomeness, are associated more with impaired effectiveness and negativistic phenomena in treatment situations.

What are frequently thought of as "bad habits" in children, thumb-sucking, head-knocking, masturbation, nail biting, the ritualistic behavior in connection with getting to bed at night and many other such manifestations are more or less common at one or another time in the life of every child. These habits can be used negativistically because they are objectionable to the adults in charge and are for a certain period persistent actions which do not yield readily to external pressures. It is too seldom appreciated that behind this behavior there is anxiety which the child attempts to master in one of these ways, so as to maintain or restore his psychic equilibrium and comfort. These so-called "bad habits" cannot constructively be influenced except through the recognition of the underlying anxieties and through attempting to relieve them. Meanwhile, tolerance for the behavior and avoidance of attempts to suppress it should rest on an understanding of its unconscious purposeful nature. When the so-called "bad habits" are carried into adulthood as such, or in the form of certain character traits or social attitudes, it is also important that their essentially defensive nature and the underlying anxiety be understood.[2]

The self-centered attitude, previously referred to as narcissistic, is many times retained in the character of the adult. Such people have maintained this early defense against infantile anxiety and can utilize it also as a resistance against the anxiety's being reactivated. These patients think of themselves as most unusual, rare patients, in whom the physician should be more interested than others. They are apt to demand and expect special attention and privilege. They tend to project this characteristic to the doctor and expect dramatic, miraculous performances from him. This is a perfect setting for feelings of disappointment in, and of rejection by the doctor, for turning to criticism, lack of confidence and failure to respond to the therapeutic efforts. The doctor sets for himself a task not likely to be accomplished if he attempts in these circumstances to come up to the patient's expectations. Worthy of note, is that illness always tends to bring out narcissistic tendencies in people; so this type of resistance is always to be kept in mind.

Closely related to the above are the omnipotent feelings, which as has already been pointed out, are defensive in nature and stem from childhood. Use of this mechanism leads patients to try to act as though they were more powerful than the physician himself. They consult medical dictionaries or texts if available, and are up to the minute on the latest reports of medical progress in popular magazines. They attempt to direct the physician, not only as regards the diagnosis he should make, but what kind and how much treatment he should administer. The attempts to control and maneuver the physician are really projections of the patient's own attempts at maintaining control over his inner strivings and impulses which he unconsciously feels are dangerous.

Sado-masochistic struggles and conflicts are especially prominent and characteristic of some personalities, and are of course, built in, as it were, during an especially difficult childhood. The sadistic elements are expressed sometimes in open attitudes of bitterness, biting sarcasm, criticism or depreciation, and at other times in a more subtle way; by trying to undermine the doctor's reputation, which often they feel may be accomplished if they should fail to get well. The masochistic elements are expressed through suffering or the seeking of it. Defiance may be

a bid for punishment and suffering, and too frequently the physician unwittingly falls into gratifying the patient. To quote Jones:

"Every surgeon whether he recognizes them or not, must encounter many cases where the patient is secretly bent on having some operation or other under various more or less plausible pretexts and it may happen that the situation happily coincides with some repressed trend of sadism in his own nature."

Yet if the physician against his good medical judgment, concedes to the patient's insistance upon unpleasant, often painful unnecessary laboratory and diagnostic procedures or surgical approaches, he will find that the patient is not really benefited. It is our job as physicians to be aware of such possibilities and to guard against unnecessary indulgence of the patient's neurotic needs.

Certain resistances arise in connection with struggles between the opposing dependence and independence strivings within individuals. The former are related to pleasant memories of being taken care of as a child, while the latter are related to efforts to become adult. If the patient is resistant against his dependent strivings he is apt to be apologetic for taking up the busy doctor's valuable time, or behave as if he did not really need medical care. He resists the doctor's advice as to the need for hospitalization or for office visits or fails to fill his prescriptions. If the patient on the other hand resists independent strivings, he is apt to become a "clinging vine" type of patient, never wanting to concede that he is well, or that he no longer needs his medicine and wants always another appointment, even if it is only to make sure that he is all right.

Of particular interest as regards resistance in treatment is the trait of obstinancy of the so-called anal character. It is often physiologically expressed in constipation. Some traces of this and other anal traits are a part of the daily behavior of most people in our culture whenever relatively early and strict toilet habits are insisted upon. This stubborness is a resistance against re-experiencing hostilities and anxieties which were associated with frustrations mainly in the course of toilet training. It accounts for many kinds of rigidity and uncooperativeness in a doctor-patient relationship, and is associated with attitudes of orderliness and parsimony. Of these last, orderliness calls upon the doctor for a high degree of promptness, consistency and perfectionism lest the patient set himself even more obstinately against the doctor's efforts. Parsimoniousness accounts for a reluctance to and sometimes even the impossibility to pay the doctor bill.

The mechanism whereby reality is denied through the use of fantasy, seen so clearly in children's games, in which they identify themselves with Superman, cowboys or policemen to avoid anxieties about their smallness, dependence and helplessness, can also act as a resistance in treatment. A patient with angina, for example, fails to carry with him his nitroglycerin tablets or to take one at the first sign of cardiac pain as instructed, because as it turns out, he does not really accept that he has angina. The reality is too closely associated with his infantile fears of annihilation.

There are many other manifestations of resistance, but one more only will be mentioned. A feeling of distrust which some people have toward others is really a distrust of themselves, a distrust of their own repressed infantile impulses. It, nevertheless, is one of the important factors to account for some patients "shopping around" from one physician to another. In this connection, however, it should be added that physicians themselves are responsible for much of this by their failure to recognize how often it happens that this very inner distrust is precisely the thing for which the patient needs help.

In light of this consideration of resistances, their meaning and significance, it is well that a physician keep in mind how much he is held in a position of authority in the thoughts and feelings of the populace. It is traditional that by reason of his special medical knowledge and ability to nurture life and assist the natural healing tendencies, he is automatically put in the role of a parental or authority figure. This facilitates the activation of what are called transference reactions, which are emotional reactions or behavior patterns quite like those of earlier life, especially these toward the parents. This sets the stage for the resistances to appear in the patient-physician relationship. These resistances will invariably follow the patterns of earlier ones, at least in modified form; thus it is obvious that knowledge of earlier psychological responses of the patient can be of aid to the physician in predicting and identifying resistances which may occur in treatment.

Since the physician also has unconscious defenses against anxieties, he is likely to become uncomfortable himself about these psychological

operations of the patient. Unless he has developed some understanding of these processes and can remain objective, calm, and collected, he sets his own resistances in operation and as Jones says, "may fall back on moral disapprobation, and abusive words are spoken of the patient's laziness, obstinancy, and general moral turpitude."

There is much to be gained for the patient's welfare and the doctor's effectiveness if the latter will lend himself to an alert watchfulness for uncooperative resistance behavior. He may then calmly and with an understanding interested manner call this to the patient's attention, then ask if the patient knows of any explanation for it. Besides being better able to cooperate with the doctor in treatment, the patient will probably then feel freer to share with his doctor more information about his thoughts and feelings and how they are related to his disability. The facilitation of expression by the patient of his worries, concerns, feelings about himself and his problems in life has therapeutic effect no matter what has brought the patient for treatment. If this has been possible, it can be seen more readily, whether or not the patient is in need of the special help of psychiatry, and if he is he should already be in a frame of mind to accept such advice.

SUMMARY

(1) The unenlightened emotional connotations of the expression "negativism" are pointed out.

(2) Psychiatric insights are drawn upon to explain uncooperative resistance behavior in the treatment of patients in general.

(3) Suggestions are made in respect to how the physician may approach such problems to the mutual advantage of the patient and himself.

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DISCUSSION (*Abstract*)

Dr. Alden Raisbeck, Chicago, Ill.—Three concepts are conveyed in the body of Dr. Harris' paper which I think are of fundamental importance in comprehension of the problem of negativistic behavior of the patient. The three are linked together rather intimately.

The first concept is the fact that negativism takes many, many forms. That is evident from his material. Negativism is not just a thing or an object to look at. It comes out in all sorts of forms and needs to be recognized. A form, which is perhaps the most irritating one and one which we have all seen, is the patient who does not get better. He has not read the book and does not know he should be better. That may depend upon a number of mechanisms. It is one which we do not often consciously see in its position as a negativistic phenomenon. There may not be concomitant phenomena, concomitant physiologic relationships involved, but there remains a small group we can always see in any practice in which there is no reason and in which sometimes we cannot even identify a psychological factor, although in most of them it is there if we study it long enough. That form of negativism is no more important than some that Dr. Harris has mentioned, but is important in terms of the fact that we often miss it as the dynamic expression of what the patient feels.

It sounds a little bit omnipotent and a little bit insulting even to say the patient does not get well simply because of something within himself, but there are some who do not. We must admit that occasionally the patient has something within him which is preventing his recovery.

A second point is important: that negativistic phenomena have in their very existence implied psychological meanings. What we as physicians often experience is the feeling that negativistic behavior represents something like an expression on the part of the patient, "I do not like you." Occasionally, that is so. It has happened to me. But most often negativistic phenomena represent much more complex mechanisms which have gone on for a great length of time in the patient's life. With a negativistic patient, we must be very careful not to take the obvious for the actual. I think now of problems, say with a peptic ulcer patient, driving, aggressive, under obvious tension, president of his firm. He develops ulcer; everybody says he is tense, and must go to the psychiatrist or to the internist who gives him a diet, and lets him get psychotherapy.

Often he does not get well as fast as we think he should, and often we find that our original conception of this man who is tense, aggressive, and not getting well, is wrong. He may not be getting well because he is such an aggressive chap that he cannot stand having someone direct his routine. But, often, he is unconsciously a very dependent person, his aggressiveness being a mask against strong dependent trends and his remaining ill represents a way to satisfy the dependent need which has never been fully gratified. So what we see is not always what is the most important.

The third point which is most important is that the physician himself becomes involved in the patient's responses. We cannot help being affected by treatment. We are happy when we have a successful outcome, personally happy, not just professionally happy. It satisfies a great deal within us to have something come out right, and we all are frustrated at times when we have bad outcomes. We go through much thinking and rationalization as to why this did not work out, or that procedure was unsuccessful. We use a fancy word for

it in psychiatry, counter transference, but actually there is nobody in the world who can get madder than a physician. Here we spend years working up to do something, we are doing it, we are often working night and day, we have gone through a vigorous internship, and all the rest of it, and we are serving society, we think and we hope. When a patient frustrates us with some manifestation of negativistic phenomena, we may become very angry. Most of us recognize this feeling. We may be a little slipshod the next time or be a little gruff or a little unpleasant with the patient, or we may make it hard for him to come to the office because of our appointment schedule. That kind of thing tends in time to affect the patient's response. It is rather inefficient in terms of human relationships.

Dr. Harris (closing).—I was especially glad to hear Dr. Raisbeck stress two of the points, which I brought out, and, one is, the tremendous part played in medical results of the type of expression, the sort of negativistic phenomena of not getting well. Dr. Raisbeck also went into some further discussion of what we, in psychiatry, often call the counter transference; that is, the physician's emotional reaction to the patient. I want here to make a point that physicians have to be alert for their own emotional reactions to the patient, in order that they steer clear of emotional involvements with the patients which do not further therapy.

PYLORIC STENOSIS IN MONOVULAR TWINS*

REPORT OF A CASE

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and
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In 1924 Moore[1] reported the first case of hypertrophic pyloric stenosis affecting each of monovular twins. Laubscher and Smith[2] in 1947 reviewed the literature and added a case report. At that time there had been only eleven cases of hypertrophic pyloric stenosis affecting each of monovular twins, and only one case affecting each of binovular twins, to which they added the second case. To our knowledge there have been no cases of pyloric stenosis in twins reported in the literature since 1947. The occurrence of another case accordingly seems worth recording.

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*From the Children's Hospital, Louisville, Kentucky, and the Department of Pediatrics, University of Louisville School of Medicine.

*These patients were from the private service of Dr. John B. Larson, and we are indebted to his courtesy in allowing us to use them for publication.

CASE REPORT

V. F. and S. F., male twins, were born on August 23, 1950, two months prior to the estimated date of delivery. The delivery was by cesarean section because of placenta previa. There was only one placenta and one layer of membranes, therefore, establishing the evidence of their being monovular twins. V. F. was delivered first and weighed 1,759 grams and S. F. weighed 1,844 grams. Five weeks later V. F. weighed 2,298 grams and S. F. weighed 2,228 grams.

They seemed to do well at home until the age of 8 weeks, at which time S. F. began to vomit his feedings and two days later V. F. also began to vomit. The vomiting, which at first was sporadic, rapidly became persistent and projectile in character. Both infants began to lose weight, and after eight days were admitted to the Children's Hospital for observation.

On admission to the hospital V. F. weighed 2,440 grams. There were easily visible gastric peristalic waves. There was a firm, oblong tumor mass, 1.5 centimeters in length, palpable by deep pressure in the right upper quadrant near the midline. This was thought to be the pylorus. Laboratory studies showed a red blood count of 2.7 million, hemoglobin of 8.5 grams, and a white count of 8,750. The differential revealed neutrophils 28 per cent, lymphocytes 70 per cent and basophils 2 per cent. The urinalysis was normal. The blood chlorides were 104.0 mEq/L., carbon dioxide content was 30.1 mEq/L., and the serum pH was 7.5. X-ray of the chest was normal. One ounce of barium was administered by bottle and x-rays were taken at the end of two, four, and twenty-four hours. At no time did any barium pass into the small bowel.

On admission to the hospital S. F. weighed 2,057 grams. He was severely dehydrated, with sunken fontanel and very poor skin turgor. The lungs were normal except for an occasional rhonchus. Examination of the heart showed a grade two blowing systolic murmur at the apex. There was no thrill and no apparent enlargement. The infant was not cyanotic. Gastric peristalic waves were also easily visualized in this infant. On palpating the abdomen, there was a small, firm tumor mass deep in the right upper quadrant. This mass was also thought to be the pylorus. Laboratory studies showed a red count of 3.4 million, hemoglobin of 11 grams and white count 12,500. The differential revealed neutrophils 25 per cent, lymphocytes 73 per cent and basophils 2 per cent. The urinalysis was normal. The blood chlorides were 96.8 mEq/L., carbon dioxide content was 29.3 mEq/L., and the serum pH was 7.52. One ounce of barium was administered by bottle and x-rays were taken at the end of two, four and twenty-four hours. The stomach was dilated, and the four-hour film showed approximately 85 per cent retention. The twenty-four hour film showed only a small amount of barium had passed into the small bowel, and also the presence of a suggestive "string sign."

Adequate doses of atropine sulfate were administered during a four-day period while hydrating the patients

and balancing their electrolytes. The vomiting persisted and became coffee-ground in appearance. At operation, olive sized tumor masses were found at the pylorus in each twin, and these were incised in accordance with the Fredet-Ramstedt technic. The postoperative course was stormy with vomiting, and abdominal distention prominent findings in S. F., and some vomiting by V. F. On the third postoperative day S. F. suddenly expired. At postmortem nothing could be found to account for the infant's death. There was no evidence of aspiration phenomena.

V. F. recovered and was discharged on the nineteenth hospital day.

SUMMARY

A case of hypertrophic pyloric stenosis in each of monovular twins has been reported bringing the total reported cases to twelve. There have been only two cases of hypertrophic pyloric stenosis reported in monovular twins with only one twin affected. The rule rather than the exception of its occurrence in both of monovular twins is strong evidence in favor of a genetic factor in the etiology.

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SIMULTANEOUS HERPES ZOSTER AND CHICKENPOX*

REPORT OF TWO CASES

By S. D. Austin, M.D.
William H. Brandon, M.D.
and
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A relationship has long been known to exist between herpes zoster and chickenpox. Chickenpox has frequently been noted to follow exposure to herpes. It has been postulated that the two eruptions represent different phases of the same disease. Another theory suggests that chickenpox in childhood makes the individual immune to herpes zoster in later life and that herpes represents a partial immunity to chickenpox in a person who has never been completely immunized by having the disease. The two diseases rarely occur simultaneously. Such a case was recently reported by Fetter and Schnabel.[1] The following are reports on two cases of concurrent herpes zoster and chickenpox which were recently seen by us, at a time when chickenpox was epidemic in this community and when sporadic cases of herpes zoster were being seen.

*Received for publication June 7, 1951.

CASE REPORTS

Case 1.—A man, age 65, noted on April 4, 1951, a small painful red spot in the left frontal area above the eyebrow. Small vesicles appeared and coalesced, the lesion enlarged, and new patches developed over the left scalp. He consulted us on April 10, 1951, at which time there were typical herpes zoster patches in the distribution of the left ophthalmic division of the trigeminal nerve, the left frontal branch of that nerve supplying the forehead and anterior scalp, and the occipital nerve supplying the posterior scalp. Two days later the patches had become larger and there had developed scattered discrete vesicles over the trunk. These were typical of the eruption of chickenpox. The left eye was swollen and there were two vesicles on the left bulbar conjunctiva. The rest of the examination was negative except for left anterior and posterior cervical adenopathy. The patient had had no known recent exposure to either chickenpox or herpes zoster, and said that he had had chickenpox as a child. He was hospitalized and treated with protamide injections daily, chloramphenicol by mouth, and analgesics. The generalized varicella rash disappeared entirely in one week. The herpetic eruption on the head improved fairly rapidly after treatment was started and by April 18, 1951, all of the lesions were involutional and pain and soreness had almost subsided.

Case 2.—A man, age 35, on March 19, 1951, developed generalized discrete papular eruption over the trunk and extremities. At the same time he noted several large patches of erythema over the left lower ribs. He was first seen by us on March 23, 1951. At that time there was a typical varicella eruption over the trunk and extremities, some of the lesions were papular, others were small clear vesicles. In the anterior distribution of the tenth and eleventh left intercostal nerves there were four typical patches of herpes zoster. About March 27, 1951, both the chickenpox and the herpes began to subside and after ten days both eruptions had disappeared entirely. On March 26 and 27, there was mild pain in the region of the herpetic lesion. No treatment except calamine lotion locally was prescribed. This patient had never had chickenpox before, and there was a history of definite exposure to chickenpox sixteen days before the onset of symptoms.

SUMMARY

Two cases of concurrent herpes zoster and chickenpox are presented.

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THE FUTURE IN GYNECOLOGY*

By J. RANDOLPH PERDUE, M.D.
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Modern gynecology may be said to belong to the past century, although, much of our useful knowledge has come down from the ancients. We have therefore had an extremely rapid growth as a specialty. Unfortunately, in the light of our increasing knowledge, greatest emphasis has been placed on removal of diseased tissues, rather than the attempt to restore function. It is therefore timely to turn our thoughts briefly on our past, and then to recent developments that we may more clearly have a glimpse into the future.

It is a source of pride to me, as I am sure it is to you, that Southerners head the list of those who have added so much to our knowledge of diseases peculiar to women: McDowell, Sims, Kelly, Miller and many others.

The year 1851, 100 years ago, brought forth a review of the literature on the simplest abdominal gynecological operation, ovariotomy. Of 222 attempted ovariotomies, 57 were never completed, the patients dying on the table; 76 died later and 89 survived, a mortality of 60 per cent. The first patient to survive was Jane Todd Crawford, operated upon by Ephraim McDowell in his home at Danville, Kentucky, in the year 1809. This ushered in modern abdominal surgical gynecology.

I think it is fitting that we honor this great pioneer gynecologist whose practice and international reputation enabled him to remove 13 ovaries in his lifetime. However, we should also note the final words of his second paper, in which his technic was described in minute detail. They were as follows: "It is my ardent wish that this operation may remain to the mechanical surgeon forever incomprehensible."

Rapidly, other phases of pelvic surgery developed and by the end of the nineteenth century the armamentarium of the pelvic surgeon included a wide variety of operative procedures. Plastic restorations were highlighted by Marion Sims' spectacular conquest of the vesico-vaginal fistula. The development of asepsis, *et cetera,* greatly decreased the risk, and as the twentieth century developed a larger and larger proportion of surgical procedures were carried out on the female generative organs. Inevitably, many of these procedures, viewed in the light of the present, became frankly meddlesome and showed an increasing disregard for the preservation of function. A classic example of this is provided by Dr. Jesse Bennett in performing the first American cesarean section. After completion of the operation he says, "I then removed both ovaries." I wonder how many bilateral oophorectomies were performed for migraine headaches, for emotional instability or for sterilization.

An operation was devised to attempt to meet every female complaint. In the wild desire to operate, all thoughtful analysis of end results or preservation of function was cast aside. This is tragically true of many great contributions to medicine. We can understand, if not forgive the physician, the untold lives lost by blood letting when we have seen the dramatic return from near death to life by such a procedure in acute heart failure. Those who have never seen one dramatic recovery following trephine of the skull for traumatic cerebral hemorrhage cannot understand why some ancient civilizations tried it on every seriously ill individual. My own greatest contribution to society came, I think, during the years 1936 and 1937 when I believe I saved eight lives by advising the discontinuance of the great new remedy of that day, sulfanilamide. Each physician's response was essentially the same: "But, doctor, her temperature is 106°, even with sulfanilamide."

In the past twenty-five years many elaborate surgical procedures have been de-emphasized, some have come into frank disrepute, while at the same time, many extremely valuable ones have been devised or re-popularized, for example: vaginal hysterectomy and the radical surgery for malignancy. The faulty conclusions of deductive reasoning have plagued us through the centuries, and we are still too prone to remember one or two cases. Textbooks which listed a choice of twenty or more names and profusely illustrated technics for suspending the uterus have dropped most of them. Increased knowledge at the general level has gone far to eliminate the ovarian cyst

*Chairman's Address, Section on Gynecology, Southern Medical Association, Forty-Fifth Annual Meeting, Dallas, Texas, November 5-8, 1951.

dissections, which cysts were in reality perfectly normal corpora lutea. Most, even in this room, were taught that surgical extirpation or x-ray destruction of both ovaries was the treatment of choice in endometriosis. Meigs, perhaps our best known authority, at present speaks strenuously in favor of the simplest surgery or none at all in this condition.

What has brought about these changes? About twenty-five years ago there had begun to be heard an occasional voice raised in favor of exploring approaches other than surgical to solve these problems. The young science of female endocrinology was suffering its birth pangs. Among distinguished leaders are Southern Medical Association members, Burch, Greenblatt, Hamblen, Karnaky, and others (the order, gentlemen, is alphabetical). Problems of menorrhagia, metrorrhagia, dysmenorrhea and sterility especially are being attacked in this manner. ACTH and cortisone remain to be investigated in relationship to gynecologic conditions.

Progress in obstetrical care has eliminated much of the need for restorative surgery. With the advent of the sulfonamides, penicillin, streptomycin, chloramphenicol, aureomycin, terramycin and the many other mycins, many conditions which resulted from infection and required radical surgical treatment have been prevented.

The proper handling of the psychosomatic patient with the application of the tools of psychology and psychiatry has given extremely promising results. In this instance, we must not overlook the patient as a whole, and the relationship between the physician and the patient. Often a little extra time and understanding given to a patient has resulted in clearing of symptoms which previously would have been handled surgically. For instance:

A 33-year-old para 2-0-0 consulted me complaining of pains in the right lower quadrant, gradually becoming more severe for the past 18 months. She had been unable to perform simple household duties. Dyspareunia was severe. She reported two stillborn children in the previous 5 years. One was a separated placenta at 8 months requiring 3 blood transfusions and the other a cord strangulation two or three days before the onset of labor. Menses were regular but fairly profuse, the last menstrual period three weeks previous. On examination, the abdomen was not remarkable, except for generalized tenderness, most marked in right lower quadrant. Pelvic examination showed the right ovary nearly twice normal size and quite tender, uterus in III° retroversion and soft about one and one-half times normal size.

How many thousands of women with such findings have had an appendectomy, partial right oophorectomy (corpus luteum) and suspension of the uterus?

But I knew this lady. She declined mild sedation saying vitreolically, "I still have the last one you prescribed!" Back in my consultation room, I casually mentioned I was sorry this had developed, because I had a baby for adoption soon and had hopes that she could be the foster mother. She left. Two weeks later, I called her to report that the mother had decided to keep her baby. "How are you," I asked. "Oh, I've been so busy and happy. I have a bassinet, 3 dozen diapers, etc.," she replied. "But your pain," I asked. "Oh, I'd forgotten that," she said, "when do I get my baby?" You know the answer and there is more. But two months later, she visited my office, did you guess it? . . . Pregnant and preening like a peacock! My unmeaning, but vicious cruelty had given her the extra courage to get pregnant again.

These are the patients we all treat each day. And I believe the true family doctor has cured a great many more of them than the quick-to-operate-uterus-suspending town surgeon! His "common sense," as he modestly calls it, is really extra ordinary sense. I prefer to call it instinct, the composite survival experience of the race, and I hesitate long before I challenge any tenet unless the rules of "common sense" apply as well or better to my answer. Many careful and precise studies have been made to show that approximately 20 per cent of pelvic operations serve no useful purpose. Our own Frank Lock has written one of the classic papers on this subject.

Education, both of the physician and the patient, is destined to weigh heaviest, I believe, in the balance which points to the future in our specialty. It is contingent upon the highly trained men of this and other similar groups to train our physicians of the future. They must be taught to perform necessary gynecological surgery with skill and without delay. Likewise they must be taught to protect their patients from the "mechanical surgeon."

The American Board of Obstetrics and Gynecology has done a magnificent job of screening the reasonably well qualified from the probably incompetent among those who submit themselves for examination. They have encouraged study. But most of all, the American Board has in-

sisted that training in gynecology and obstetrics be concomitant. I believe the future will see continuation of an additional confirmation of the soundness of this policy.

In this connection, I should like to state, I am opposed to the formation of an American Board of Pelvic Surgery or a similar organization. The purpose of those behind such a plan is surely good because these men are nearly all splendid obstetricians and gynecologists. But I feel this will lead to further breaking the faith with Ephraim McDowell.

Education of the patients would bring them to a well trained physician for periodic examination. The early detection and proper handling of lesions could prevent many serious conditions requiring drastic surgery.

In conclusion, may I offer these glimpses of the future in gynecology, or at least our hopes for the future.

(1) I predict that the surgical phase of the development of the art and science of gynecology is on the decline, and that the pattern of these surgical procedures will change with increasing knowledge.

(2) I predict the virtual disappearance of the supravaginal hysterectomy and its probable forbiddance in hospital operating rooms. The solitary cervix has no function.

(3) I predict a closer professional scrutiny of proposed pelvic surgery in all licensed and approved hospitals to the end that our women may be protected from meddlesome and multilating surgery.

(4) I predict that through cytology and its related and concomitant fields of development, carcinoma of the uterus will rapidly fall below its present 25 per cent plus, of the mortality from cancer in women.

(5) I believe endocrinology will continue to solve problems now considered surgical, for example: the fibroid which now decreases in size only after artificial or natural menopause and satisfactory lactation.

(6) Advances in the field of antibiotics will continue to the ultra viruses and beyond.

(7) I predict more precise methods of diagnosis of the solid or semi-solid ovarian tumor, which now must be treated fairly radically.

(8) I predict a continued expansion of public knowledge of gynecology and a continued increase in the number of qualified gynecologists.

(9) With this accomplished, I predict, finally, a 40 per cent reduction in the number of necessary pelvic operations on women, and much more than 40 per cent increase in "health and happiness" salvage from our labors.

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SOUTHERN MEDICAL ASSOCIATION
Forty-Sixth Annual Meeting
Miami, Florida, November 10-13, 1952

WALTER COLQUITT JONES

PRESIDENT-ELECT

The new President-Elect is well known to members of the Association because of his friendliness and his winning and dynamic personality. He has a large circle of admirers and devoted friends. He has behind him years of popularity in and loyalty to the Southern Medical Association, which he joined in 1924. He was Chairman of the Section on Surgery in 1946, and a member of the Council representing Florida from 1941 to 1945, and Chairman in 1945. He has published several papers in the JOURNAL* which show the fine caliber of his scientific achievements.

As Chairman of the Entertainment Committee at the 1929 meeting of the Association in Miami, he arranged a beach party with turtle steaks which is unforgettable. He holds membership in a number of medical and surgical societies.

One-third of the sons of clergymen are said to rule the universe, and the new President-Elect comes under this classification. The son of Walter Colquitt Jones, a Methodist minister, and Martha Powell Jones, he was born in Waverly Hall, Georgia, November 27, 1896, and was educated in Georgia's schools. He received his A.B. degree at Meridian College in 1917 and his M.D. from Emory University School of Medicine in 1921.

He and Miss Dorothy Jennings of Union, South Carolina, were married in Miami in 1924. They have two sons, Walter, who has recently received his college degree and expects to follow in the footsteps of his father in the medical profession, and Clarke, who is now on active duty with the Armed Forces. Dr. Jones has lived in Miami since he began the practice of medicine, and he has taken an active part in medical and civic affairs in his adopted city.

He was President of the Dade County (Miami) Medical Association in 1928, when only thirty-two years of age, and was President of the Florida State Medical Association in 1941. He is a member of the surgical staff of Victoria Hospital in Miami, has been a Chief of the Surgical Staff of Jackson Memorial Hospital since 1926, and was President of the Staff in 1930.

He is an able golfer, fisherman and a hunter, but his main hobby is the growing of orchids. His marvelous exhibit of orchids at the Southern Medical Association meeting in Miami in 1946 will be recalled. He is recognized from afar at all meetings by the beautiful orchids which he wears every day and which he gives to his friends. His interest began some fifteen years ago when he collected native orchids as a hobby from their natural habitat in the everglades and swamps. He has turned the hobby into a profitable enterprise, and become president of one of the finer commercial orchid nurseries in the country, whose exhibits are now sought after and are blue ribbon winners in many flower shows.

He is a member of the Methodist Church, the Miami Country Club, the Riviera Country Club, the Century Club, the Jesters, and the Mahi Shrine Temple.

All may rest assured that he will give the same wise leadership to the Southern Medical Association in 1953 which he has exhibited in his past very productive activities.

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HORMONES IN TOXEMIA OF PREGNANCY

The use of cortisone has been suggested as beneficial in treating the toxemias of pregnancy. As supporting evidence for the value of the therapy, Buchan[1] in the *British Medical Journal* has compared the regional distribution of death rates of a number of diseases which he considers allied to each other and to adrenal cortical deficiency. Rheumatic fever and acute nephritis, he says, by current theory represent an allergic response to a hemolytic streptococcal infection. Heart disease in the group of children aged 5-14 is considered 90 per cent rheumatic in origin. Rheumatic fever, acute nephritis, scarlet fever, and heart disease in young persons, puerperal sepsis, stillbirths, and eclampsia, he compares in geographical incidence in England and Wales, considering all of them as related to infection with a hemolytic streptococcus, and a subsequent adrenal cortical deficiency.

Their regional incidence he finds directly similar, supporting a similar etiology. The incidence of rheumatic fever and acute nephritis he correlates directly with the scarlet fever death rate at 0-4 years of age, and with the regional variations of mortality of eclampsia, nephritis, and puerperal sepsis, "a circumstance which along with the other relationships indicated would seem to support the use of cortisone in toxemia of pregnancy, as well as in other diseases suspected of being streptococcal in origin."

There is of course no typical adrenal pathology of conditions known clinically to be benefited by cortisone.[2] Neither has a typical pancreatic pathology been demonstrated for diabetes; so one cannot take this failure as evidence that cortisone should not be administered, any more than one can stop using insulin in diabetes. The pathology of diseases benefited by cortisone for the present must be sought outside the adrenals, as the pathology of diabetes seems to lie outside the pancreas.

Cortisone and ACTH are among the most promptly potent of the hormones. Their effects upon, for example, potassium metabolism, may be profound, and alterations of potassium distribution have shown increasing clinical importance in recent years. Normal heart action is impossible without a normally functioning supply of potassium. Syndromes of muscle spasm suggestive of convulsions, and profound muscle weakness occur in potassium disturbances and may be abruptly produced or terminated by specific therapy.[3]

The Smiths,[4] of Brookline, Massachusetts, have long advocated administration of estrogens in a number of different types of abnormal pregnancy, or in normal pregnancies as a preventive of complications. In their work, considerable effort has been expended in study of estrogen excretion and the estrogen levels of the serum, which has not been done for cortisone. Estrogen therapy will not have promptly notable effects upon serum potassium. Adequate thyroid function is also known to be necessary to normal gestation. Further studies of potassium changes and potassium control will throw more light upon the subject of cortisone therapy in eclampsia, and one would say that at present there is less definite evidence for value of cortisone in toxemia of pregnancy than for administration of several other endocrine products.

The new potent therapeutic agents have occasional side effects which make their administration without specific indications very undesirable,[5,6] and make advisable special instruction in medical schools upon the syndromes which may be brought on by modern popular therapeutic agents themselves.

CONVERSIONS

"Religion, politics, and psychiatry often face a common problem: that of seeking the most effective means of bringing about rapid changes in an individual's beliefs and actions and afterwards trying to stabilize them," says Sargant,[7]

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of St. Thomas Hospital in London. Ministers, statesmen, and physicians have this common aim: to influence individuals to a voluntary course of action different from the one which they have followed.

The conditioned reflexes are the best understood physiological mechanism of behavior. Sargant reviews the extensive and many times confirmed studies of the great physiologist Pavlov upon the conditioned reflex, and correlates them with study of the abnormal mental patterns of the war neuroses, and the various shock, abreactive, drug, and religious technics of treating abnormal mental states and tendencies, or changing mental habits. Understanding of methods of altering the conditioned reflexes should be useful in changing human beliefs and actions and in political propaganda. Of course, a conditioned reflex is by definition an action which promptly follows a certain stimulus without going through the higher centers, an automatic and seldom failing response. Yet the individual is constantly developing new conditioned reflexes and discarding old ones. Observations of Pavlov upon circumstances under which the reflexes were learned or unlearned are profoundly significant.

A group of Pavlov's dogs, Sargant recalls, were accidentally trapped in their cages during the Leningrade flood of 1924, and were rescued while swimming about with their heads just above the still rising water. After their rescue, some of them passed into a stupor, a temporary complete "protective" cortical inhibition from fright. Others remained in a state of intense excitement.

In those which went into a stupor, the recently implanted conditioned reflexes were dramatically abolished. In those which responded with excitement, the reflexes were much less affected. Pavlov followed this as a lead to a method of speedy breaking up of implanted behavior patterns. In some of the dogs a completely new set of conditioned reflexes could be substituted with the abolition of the old. The weakest of the animals became permanently unstable and could never be reconditioned.

Some animals proved remarkably stable under all sorts of stress. These, once changed by extreme measures, developed new reflexes of extraordinary persistency. Debilitating diseases and procedures could make the more stable individuals more subject to change of behavior patterns and to abolition of the learned reflexes.

Sargant speaks of violent religious conversions which he studied in the United States in 1948, of a type which he says were common in England among the Methodists two hundred years ago, and were "able to change the face of England during the Methodist revival of the eighteenth century." He attended meetings of evangelists, handlers of poisonous snakes, religious rites in which Negroes did violent jitterbug dancing to the point of exhaustion. They were worked up to a state of tremendous excitement, and to a critical point of religious conversion. Committees worked with them later to stabilize the sudden conversions thus made. Argument, concludes Sargant, cannot change fixed ideas. Emotion must be the disruptive influence. Hence excitement is a tool for conversion among these groups.

One sees in this alteration of conditioned reflexes after violent or debilitating experiences, a possible explanation of the benefits of shock therapy as used with the insane. Hypoglycemia, metrazol, electric shock therapy, are insults to the nervous system which may have the same effects as terror, in abrogating the reflexes which were driving the individual; and thus may result in greater amenability or a personality change. These physiological facts are important to the individual and to society.

TWENTY-FIVE YEARS AGO
From Journals of 1927

Southern Medical Association Officers for 1927.[1]—President, Dr. J. Shelton Horsley, Richmond, Virginia; First Vice-President, Dr. Frank K. Boland, Atlanta, Georgia; Second Vice-President, Dr. Alfred A. Walker, Birmingham, Alabama. . . . Monday, November 15 . . . the Association met in the main Auditorium, Atlanta, Georgia, and was called to order by Dr. Frank K. Boland, General Chairman of the Committee on Arrangements.

Delinquency.[2]—Under the auspices of the National Institute of Industrial Psychology, which exists for the application of psychology and physiology in industry and commerce, Professor Cyril Burt, psychologist to the London County Council, delivered an important address on "The Vocational Advisers and the Young Delinquent." . . . He said that most hardened criminals begin their

1. Minutes: Southern Medical Association. Sou. Med. J., **40**: 61, 1927.
2. Foreign Letter, London. J.A.M.A., **88**:41, 1927.

career during childhood. Many inquiries into the causes of delinquency have now been carried out. They show that we can no longer assume with Lombroso that the habitual criminal is a born offender, inheriting a propensity to crime which can never be rooted out. . . . When young criminals are brought to the psychologist for examination, it is found that a large percentage . . . are in employments that are not suited to their capacities and interests. . . . Statistics reveal a great increase of crime about the age of adolescence.

Are We Degenerating?[1]—The Royal College of Physicians adopted the unusual course of appointing a clergyman to deliver the Lloyd Roberts lecture. The lecturer was Dean Inge of St. Paul's Cathedral. The dean . . . has completely mastered the latest biologic teaching, which he applies with relentless logic to social problems. . . . His subject was racial degeneration. . . . There has been a gradual lowering of the perfection of our sense organs. Our teeth have decreased in size and strength. Our jaws are becoming too small for our teeth, our eyesight has deteriorated. . . . Having clothing and weapons, we do not need fur or claw. The day may come when we shall not be able to walk or write. We shall use the motor car for the first and the typewriter for the second. . . . Former civilizations disappeared because the barbarians broke through the fence. . . . The Russian nation has been almost completely decapitated. . . . The really pressing problems are very different from those in which our politicians interest themselves.

1. Foreign Letter, London. J.A.M.A., **88**:43, 1927.

Medical Education

A meeting of the Committee on Medical Education of the Southern Medical Association was held during the annual meeting of the Association, Dallas, Texas, November 5-8, 1951. Members present: Dr. Milford O. Rouse, Dallas, Texas; Dr. R. L. Sanders, Memphis, Tennessee; Dr. W. Kendrick Purks, Vicksburg, Mississippi; and Dr. Waverly R. Payne, Newport News, Virginia. The Chairman of the Committee, Dr. R. Hugh Wood, Dean of Emory University School of Medicine, Atlanta, Georgia, was unable to attend the Dallas meeting and requested Dr. Milford O. Rouse to act as Chairman. Dr. Walter E. Vest, another member of the Committee, was not able to attend the Dallas meeting.

REPORT OF COMMITTEE ON MEDICAL EDUCATION

The present Committee on Medical Education feels that there is a definite place for some real constructive work by a group charged with reviewing the problems of medical education as it particularly affects Southern states, and would therefore recommend that the Committee be put on a permanent basis with change in the By-Laws as needed. The Committee would also suggest that the Council consider enlarging the scope of the Committee's work to include problems of hospitals which are so closely related, the Committee in the future to be known as the Committee on Medical Education and Hospitals. This would be in conformity with the plan of the American Medical Association and of many state associations that have committees or councils on medical education and hospitals.

We suggest an active friendly liaison with the American Medical Association's Council on Medical Education and Hospitals and with the various state committees on medical education and hospitals. A practical plan will be to urge our Chairman and other members to attend the annual meeting on medical education, including postgraduate medical education, held in Chicago each February. We also suggest that some constructive work could be done by our Committee's meeting during the 1952 American Medical Association session with representatives of state committees on medical education and hospitals from the territory of the Southern Medical Association.

We invite the medical associations of all Southern states to appoint committees or councils on medical education and hospitals if such are not now in operation, for a cooperative study of the following problems:

(1) Plans to interest more young physicians in locating in rural areas and smaller towns.

(2) Problems of Negro medical education.

(3) Problems of better hospital and intern and resident training facilities for Negro physicians and nurses.

(4) Postgraduate medical education for practicing physicians. Attention is directed to the highly successful telephone postgraduate broadcasts used in Indiana last year and by dentists on a national scale for three years. We suggest that the American Medical Association Council on Medical Education and Hospitals study the possibility of telephone postgraduate broadcasts on a national hook-up from American Medical Association headquarters.

We commend the excellent work being done by the Board of Control of Southern Regional Education.

Your Committee feels that it is most imperative that all physicians respond at once to the invitation to provide additional funds for medical education and thereby further check the trend toward federal control of medicine. We therefore recommend that the Southern Medical Association heartily endorse the American Medical Education Foundation; that the Council of the Southern Medical Association make a worthy financial contribution to this Foundation, and that all facilities of the Southern Medical Association be used to promote contributions to the Foundation. Our JOURNAL will be an effective medium and all Councilors should consider it a privilege to promote the Foundation. Suggestion is made that the American Medical Association might promote a more practical plan of inviting contributions at county medical society levels.

(*Signed*) MILFORD O. ROUSE, *Acting Chairman*
R. L. SANDERS
W. KENDRICK PURKS
WAVERLY R. PAYNE
Committee

Doctor-Hospital Relationship

A meeting of the Committee on Doctor-Hospital Relationship of the Southern Medical Association was held during the annual meeting of the Association, Dallas, Texas, November 5-8, 1951. Members present: Dr. J. B. Lukins, Chairman, Louisville, Kentucky, and Dr. Edgar M. Dunstan, Atlanta, Georgia. Sitting with the Committee at the request of the Chairman was the President, Dr. Curtice Rosser, Dallas, Texas. Other members of the Committee, Dr. Oscar B. Hunter, Washington, District of Columbia, and Dr. Allan D. Tuggle, Charlotte, North Carolina, were not able to attend the Dallas meeting and the other member, Dr. F. A. Holden, Baltimore, Maryland, was unable to sit with the Committee due to another meeting at the same time.

REPORT OF COMMITTEE ON DOCTOR-HOSPITAL RELATIONSHIP

The relationship of the medical staff and the hospital poses in most communities a very complex problem. There are so many factors to be considered and so many groups to be satisfied that only a Solomon could come up with a complete answer. The medical and surgical staff, the hospital authorities, the school of nursing, all have a strong hand in what goes on within the confines of any institute of healing. No doubt all three of these organizations have as their prime object, "The Welfare of the Patient."

Human nature being what it is, there is frequently some disagreement as to the best and quickest way to arrive at the restoration of health.

Over and above the local organization, we have the great national bodies as overseers, the American Medical Association, the American College of Surgeons and the American Hospital Association. The American Medical Association makes the policies of the entire medical profession. The American College of Surgeons has elevated surgery and the hospitals to a high standard, not excelled in all the world. The American Hospital Association has organized all the worthy hospitals and laid down a program of efficiency that has elevated the nursing profession and has rendered immeasurable good to the patient and the public at large.

There has been considerable complaint that the American Hospital Association has gone too far in dictating procedure to local hospitals, to the point where it interferes with the individual practice of medicine in the hospital. Many doctors who are only on the courtesy staff and are not working daily in a given hospital, complain that everything is so standardized and regulated that they hesitate to employ their usual methods of treatment lest it be different or counter to the usual procedure in that particular institution. This is often an unjust criticism, for some medical committee or group of doctors has usually made these regulations.

That there is encroachment by the hospitals and corporations on the practice of medicine, nearly every one admits. A large percentage of hospitals employ the radiologist and pathologist and in some places the anesthetist on a salary basis. This, of course, is contrary to ideal procedures and in some states is contrary to law, but it would seem very impractical and a great loss of time and an inconvenience to the patient for each doctor to call his own radiologist or own pathologist. Specialists essential to the internal conduct of a hospital should remain on an independent basis even though appointed by the hospital with the approval of the medical board to head the laboratories concerned and should receive compensation by sharing in the profits of their own work instead of a salary.

The rapid growth of Blue Cross and of Blue Shield has further complicated the picture. We positively state that no medical service should be included in a hospital contract. The Blue Cross and several others adhere to this principle. We believe all should. In the East, in a large teaching hospital, owned and controlled by one of our most renowned institutions of learning, the residents operate on many of the patients, some of which are never seen by the active staff. These residents are paid a nominal monthly salary and the check from the insurance company for the surgery is paid directly to the hospital. At the present time this is being exposed by the medical society of the state. We will be interested in the outcome. We believe every private patient, including those with health insurance, should have his own private physician in charge of the case or, in the event that he does not have a private physician, one who has the approval of the medical staff should be suggested by the hospital at the time of admission.

The staff and the hospital are interdependent. A first class medical staff cannot long exist as such without a first class hospital in which to work. On the other hand, it is obvious that for a hospital to remain in Class A, it must be staffed by first class doctors.

In every hospital there should be a well organized department of general practice. This is just as important as a department of surgery or any other specialty. Without a department of training for the general practitioner there can be no source of supply of trained men to fill the great need in rural communities.

In a report of this nature we cannot lay down rules and regulations but can only state principles and possibly make a few suggestions.

For all the troubles and differences of the hospital and the medical staff there is no panacea. There can be no one plan that will work in all places. A careful reading of the code of ethics of the American Medical Association would be very beneficial to both the medical staff and the administrators of the hospitals.

There is a plan for human relations given many hundreds of years ago that has been called "Golden:" "Do unto others as you would have others do unto you."

This complex problem is difficult of solution and there is apparently much work to be done in the future. Since the problem of doctor-hospital relationship is a continuing one, the members of this Committee recommend that this Committee be continued. Dr. Curtice Rosser, President, and Mr. C. P. Loranz, Secretary-Manager, met with the Committee and concurred in this recommendation.

(*Signed*) J. B. LUKINS, *Chairman*
EDGAR M. DUNSTAN
CURTICE ROSSER
For the Committee

Book Reviews

Handbook of Nutrition. A Symposium. Prepared under the auspices of the Council on Foods and Nutrition of the American Medical Association. Second edition. 717 pages with illustrations. Philadelphia: The Blakiston Company, 1951. Price $4.50.

One of the American Medical Association's most useful and valued publications has been the "Handbook of Nutrition." A symposium prepared under the auspices of that organization's Council on Foods and Nutrition, the Handbook first made its appearance in 1943. The rapid advances that have been made in this dynamic field, to a measurable extent as a result of the impact of World War II, as pointed out by Dr. James S. McLester, the Council's Chairman, in his introduction, have made imperative a complete revision of this book. The chapters comprising this second edition have previously appeared in the *Journal of the American Medical Association,* beginning with Dr. Ancel Keys' essay on Energy Requirements, from February 1950 on, but are here collected in convenient book form. Each chapter is written by an active investigator in his field, and the contributions represent the work of many of the major nutrition laboratories of this country. In addition to the section of eleven chapters dealing with the individual nutrients, three other groups of chapters are provided, dealing respectively with nutritional needs, nutritional requirements, and foods and their nutritional qualities. There is also a complete index. All physicians should obtain a copy of this highly useful, readable, and inexpensive publication.

The Pharmacologic Principles of Medical Practice. By John C. Krantz, Jr., Professor of Pharmacology, School of Medicine, University of Maryland, and C. Jelleff Carr, Associate Professor of Pharmacology, School of Medicine, University of Maryland. Second edition. 1,116 pages with illustrations. Baltimore: The Williams and Wilkins Company, 1951.

The second edition of Krantz and Carr's "Pharmacological Principles of Medical Practice" is an extensive revision of the 1949 edition, an up-to-date and highly useful textbook. It has been revised in accordance with the Fourteenth Revision of the United States Pharmacopeia, and many new drugs are considered. Among the changes are an expansion of the section on antibiotic therapy, a chapter dealing with the chemotherapy of tuberculosis, a new chapter on anti-motion sickness drugs, as well as discussions of the treatment of rickettsial diseases and the use of ACTH and cortisone in rheumatoid arthritis. Although most of the newer therapeutic agents have been included, no mention could be found of urecholine. The authors have made wide use of charts, graphs, structural formulas, and photographs in addition to the traditional reproductions of kymograph tracings. Space is also devoted to the general principles of the action of drugs, prescription writing, and a review of methods by which new drugs are evaluated. This revised text should prove of value to medical students and practitioners.

Books Received

Plastic Surgery of the Nose. Including Reconstruction of War Injuries and of Deformities from Neoplastic, Traumatic, Radiation, Congenital, and other Causes. By James Barrett Brown, M.D., Professor of Clinical Surgery, Washington University School of Medicine, St. Louis, Mo.; and Frank McDowell, M.D., Assistant Professor of Clinical Surgery, Washington University School of Medicine, St. Louis, Missouri. 427 pages with 379 illustrations, 48 in color. St. Louis: The C. V. Mosby Company, 1951. Price $15.00.

Medical Milestones. By Henry J. L. Marriott, M.D. Foreword by Sir Alexander Fleming. 293 pages. Baltimore: The Williams & Wilkins Company, 1952. Price $3.50.

An Introduction to Materia Medica and Pharmacology. By Elsie E. Krug, R.N., M.A., Instructor in Pharmacology and Anatomy and Physiology, St. Mary's School of Nursing, Rochester, Minnesota; and Hugh Alister McGuigan, Ph.D., M.D., Professor Emeritus of Materia Medica, Pharmacology and Therapeutics, University of Illinois, College of Medicine, Chicago. 612 pages with 37 text illustrations and 10 color plates. Sixth edition. St. Louis: The C. V. Mosby Company, 1951. Price $4.25.

A Course in Practical Therapeutics. By Martin Emil Rehfuss, M.D., F.A.C.P., Professor of Clinical Medicine and Sutherland M. Prevost Lecturer in Therapeutics, The Jefferson Medical College, Philadelphia; and Alison Howe Price, A.B., M.D., Associate Professor of Medicine, The Jefferson Medical College, Philadelphia. Second edition. 938 pages, illustrated. Baltimore: The Williams and Wilkins Company, 1951. Price $15.00.

Cardiac Pain. By Seymour H. Rinzler, M.D., F.A.C.P., Adjunct in Medicine and Cardiovascular Research Unit, Beth Israel Hospital, New York, New York. 139 pages, illustrated. Springfield, Illinois: Charles C. Thomas, Publisher, 1951. Price $3.75.

Textbook of Refraction. By Edwin Forbes Tait, M.D., Ph.D., Associate Professor of Ophthalmology, Temple University School of Medicine. 418 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1951. Price $8.00.

International Health Division. Annual Report 1950. 211 pages, illustrated. New York: The Rockefeller Foundation, 1951.

International Pharmacopoeia. First edition. Volume I. 406 pages. Also available in French and Spanish editions. Geneva: World Health Organization, 1951. Price $5.00.

Backache, Birth and Figure Relief By Self-Revolving Hipbones. By Wm. Schoenau, Los Angeles, California. 264 pages, illustrated. Los Angeles, California: Wm. Schoenau, Publisher, 1951. Price $2.00.

Rehabilitation Nursing. By Alice B. Morrissey, B.S., R.N., Instructor in Rehabilitation Nursing, New York University-Bellevue Medical Center; Supervisor of Nursing Service, Department of Physical Medicine and Rehabilitation, Bellevue Hospital. Foreword by Howard A. Rusk, M.D., Professor and Chairman of the Department of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center; Associate Editor, *The New York Times.* 299 pages. New York: G. P. Putnam's Sons, 1951. Price $5.00.

Surgery of the Oblique Muscles of the Eye. By Walter H. Fink, M.D., Minneapolis, Minnesota. 350 pages with 93 illustrations including 18 in color. St. Louis: The C. V. Mosby Company, 1951. Price $8.75.

Conference on Problems of Aging. Transactions of the Thirteenth Conference, February 5-6, 1951. New York, New York. Edited by Nathan W. Shock, Chief, Section on Gerontology, National Heart Institute, National Institutes of Health and the Baltimore City Hospitals, Baltimore, Maryland. 194 pages. New York: Josiah Macy, Jr. Foundation, 1951. Price $4.00.

Factors Regulating Blood Pressure. Transactions of the Fifth Conference, February 15-16, 1951, New York, New York. Edited by Benjamin W. Zweifach and Ephraim Shorr, Department of Medicine, Cornell University Medical College, New York, New York. 238 pages, illustrated. New York: Josiah Macy, Jr. Foundation, 1951. Price $3.75.

Nerve Impulse. Transactions of the Second Conference, March 1-2, 1951, New York, New York. Edited by David Nachmansohn, M.D., Department of Neurology, College of Physicians and Surgeons, Columbia University. 204 pages. New York: Josiah Macy, Jr. Foundation, 1951. Price $3.50.

Liver Injury. Transactions of the Ninth Conference, April 27-28, 1950, New York, New York. Edited by F. W. Hoffbauer, M.D., Department of Medicine, University of Minnesota Medical School, Minneapolis, Minnesota. 232 pages, illustrated. New York: Josiah Macy, Jr. Foundation, 1951. Price $3.00.

Renal Function. Transactions of the Second Conference, October 19-20, 1950, New York, New York. Edited by Stanley E. Bradley, Department of Medicine, College of Physicians & Surgeons, Columbia University. 178 pages, illustrated. New York: Josiah Macy, Jr. Foundation, 1951. Price $3.00.

Adrenal Cortex. Transactions of the Second Conference, November 16-17, 1950. Edited by Elaine P. Ralli, Department of Medicine, College of Medicine, New York University, New York, New York. 209 pages, illustrated. New York: Josiah Macy, Jr. Foundation, 1951. Price $3.00

Annual Report of the John and Mary R. Markle Foundation, 1950. 75 pages. New York: The Markel Foundation, 1951.

Southern Medical News

ALABAMA

A public Seminar on Multiple Sclerosis was held in the auditorium of the Jefferson-Hillman Hospital, Birmingham, recently. It was the first to be held in Alabama and was open to the general public. Dr. Wilmot S. Littlejohn, Birmingham, Chairman of the medical advisory board of the Alabama Chapter of the National Multiple Sclerosis Society, was the Seminar chairman.

Dr. Donald B. Sweeney, instructor in neurosurgery, Medical College of Alabama, Birmingham, and five other surgeons founded the new Congress of Neurological Surgeons. Its organizational and first annual meeting was held in Memphis, Tennessee, recently. Its second annual meeting will be held in New Orleans, Louisiana in 1952. Dr. Sweeney was named a member of the board of directors.

Birmingham Baptist Hospital, Birmingham, has elected to head its medical staff: Dr. G. J. Roscoe, president, Dr. Walter G. Haynes, vice-president; and Dr. Clyde W. Brown, secretary.

A campaign is being conducted to raise $675,000 to provide additional beds at the Birmingham Baptist Hospital, Birmingham. The money will be divided equally between the West End unit and the Highland Avenue unit. Contract has been let at the West End unit for an addition of an East wing to add 80 beds and a North wing for other accommodations.

ARKANSAS

University of Arkansas School of Medicine, Little Rock, has received a grant of $15,000 from the National Fund for Medical Education which is to be used for instruction purposes.

Dr. L. P. Good, Texarkana, has been elected president-elect of the Southwestern Surgical Congress.

Dr. W. A. Reilly, formerly on the faculty of the University of Arkansas School of Medicine, Little Rock, has been appointed to direct the radioisotope unit of the Veterans Hospital, Fort Miley, California.

Dr. Carl A. Rosenbaum, Little Rock, has been appointed a trustee of the University of Arkansas.

Dr. Fred H. Krock, Fort Smith, has been elected Arkansas councilor of the Southwestern Surgical Congress.

Dr. Carroll F. Shukers, Little Rock, has been appointed chief of laboratory service at the Veterans Administration Hospital, Little Rock.

Dr. J. H. Moseley has moved from Hampton to Warren.

DISTRICT OF COLUMBIA

The new Pediatrics and Crippled Children's Building of Gallinger Municipal Hospital, Washington, was opened recently. It is a 170-bed unit and was built at a cost of $2,000,000.

Major General Harry G. Armstrong, Surgeon General of the U. S. Air Force, holds the national presidency of two medico-military organizations, the Association of Military Surgeons and the Aero Medical Association.

Dr. Hugh H. Hussey, Washington, who was appointed Associate Editor of *GP*, the official organ of the American Academy of General Practice, last summer, is the new Editor of *GP*. The former Editor, Dr. Walter C. Alvarez, resigned, but will continue as a member of the staff in the position of Associate Editor.

District of Columbia Division of the American Cancer Society, at its fifth annual meeting held recently, elected Dr. Murray M. Copeland, president; Dr. Harry H. Kerr, vice-president; and Dr. Calvin T. Klopp, secretary, all of Washington.

Dr. Winfred Overholser, superintendent of St. Elizabeths Hospital and professor of psychiatry, George Washington University School of Medicine, Washington, received the Gold Key Award, the highest recognition offered by the American Congress of Physical Medicine, at its annual meeting held in Denver, Colorado, last fall. This recognition was for Dr. Overholser's work in occupational therapy and rehabilitation.

Dr. W. Randolph Lovelace II, Chairman of the Armed Forces Medical Policy Council, Washington, recently made a world tour of United States installations to obtain suggestions for improving military medicine and surgery.

Dr. Joseph S. Wall, for fifteen years Chairman of the Medical Staff of Children's Hospital, Washington, has resigned that post but continues as a member of the consulting medical staff and a member of the Board of Directors of the Hospital.

The Pan American Sanitary Bureau, Washington, regional office of the World Health Organization, has been authorized to establish a zone office in Buenos Aires which will serve Argentine, Chile, Paraguay and Uruguay.

FLORIDA

The University of Florida will hold its sixth annual midwinter Seminar in Ophthalmology and Otolaryngology in Miami Beach, January 14-19. Dr. Walter T. Hotchkiss, Miami Beach, is secretary.

Dr. Warren W. Quillian, Coral Gables, was installed president of the American Academy of Pediatrics at its meeting held recently in Toronto, Canada.

International Society for Geographic Pathology, whose activities were interrupted by the war, has been reorganized. The next conference will be held in Liege, Belgium, July 15-18. For information address Dr. Virgil H. Moon, Secretary, Medical Research Unit, University of Miami, Coral Gables. Dr. Moon organized the National Committee for the United States.

Dr. Thomas S. Griggs, Miami, is taking a postgraduate course in anesthesiology in New Orleans, Louisiana.

Dr. Harrison G. Palmer, St. Petersburg, has been visiting numerous hospitals and clinics throughout the eastern United States and Canada.

Dr. Philipp R. Rezek, Miami, recently presented a paper before the International Congress of Clinical Pathologists at London, England.

GEORGIA

The Southern Section of the American Laryngological, Rhinological and Otological Society will meet in Atlanta at the Academy of Medicine, January 14.

Communicable Disease Center will give Laboratory Training Courses January 1 to December 31. Information and application forms can be obtained from the Chief, Laboratory Training Services, Communicable Disease Center, U. S. Public Health Service, P. O. Box 185, Chamblee.

Medical College of Georgia, Augusta, announces two postgraduate courses: Dr. Charles W. Hock, assistant professor of medicine, a course entitled "Advance in Medicine," March 3-5; and Dr. Robert B. Greenblatt, professor of endocrinology, the Eighth Postgraduate Course in Endocrinology, May 26-31.

Georgia Chapter of the American College of Surgeons at its meeting held in Augusta in October elected Dr. Luther H. Wolff, Columbus, president; Dr. Thomas Harrold, Macon, vice-president; Dr. J. H. Semans, Atlanta, secretary; and Dr. Joseph C. Read, Atlanta, treasurer. The Chapter will meet in Columbus for its 1952 meeting.

Georgia Academy of General Practice at its recent meeting held in Macon elected Dr. Albert R. Bush, Hawkinsville, president; Dr. Peter Hydrick, College Park, vice-president; and Dr. Maurice Arnold, Hawkinsville, secretary-treasurer.

Mitchell County Hospital, Camilla, has appointed the following as consultants to the medical staff: Dr. Thomas Mack Sutton, pediatrics; Dr. J. Z. McDaniel, urology; Dr. Fred E. Murphy, orthopedics; Dr. Ernest Wahl, internal medicine; and Dr. Charles H. Watt, surgery.

The Screven County Hospital which opened in Sylvania in September, has elected Dr. James Freeman as chief of staff; Dr. W. C. Simmons as staff secretary, and has secured for part-time services Dr. Jack Levy of the staff of the Medical College of Georgia, Augusta, radiologist; and Dr. D. F. Mullins, Jr., Athens, pathologist.

Savannah's Warren A. Candler Hospital has added the following to the medical staff: Dr. Irving Victor, urologist; Dr. Warren U. Clary, neuro-surgeon; Dr. Ernest Edwards, orthopedist; Dr. Hollis E. Puckett, internist; Dr. Vincent Circincioni, dermatologist; and Dr. Alexander Paderewski, dentist.

Dr. J. G. Bohorfoursh, chief, Professional Services, Veterans Administration Hospital, Augusta Annex, has been appointed associate professor of clinical medicine at the Medical College of Georgia, Augusta.

MEDICAL NEWS continued on page 48

ANNOUNCING

THE FIFTEENTH ANNUAL MEETING

OF

THE NEW ORLEANS GRADUATE MEDICAL ASSEMBLY

CONFERENCE HEADQUARTERS — MUNICIPAL AUDITORIUM

MARCH 10-13, 1952

GUEST SPEAKERS

Leo V. Hand, M.D., Boston, Mass.
Anesthesiology

John H. Lamb, M.D., Oklahoma City, Okla.
Dermatology

J. Arnold Bargen, M.D., Rochester, Minn.
Gastroenterology

Ralph A. Reis, M.D., Chicago, Ill.
Gynecology

Charles A. Doan, M.D., Columbus, Ohio
Medicine

John P. Merrill, M.D., Boston, Mass.
Medicine

William Parson, M.D., Charlottesville, Va.
Medicine

Jacob E. Finesinger, M.D., Baltimore, Md.
Neuropsychiatry

Leroy A. Calkins, M.D., Kansas City, Kan.
Obstetrics

John H. Dunnington, M.D., New York, N. Y.
Ophthalmology

Edward L. Compere, M.D., Chicago, Ill.
Orthopedic Surgery

Hayes Martin, M.D., New York, N. Y.
Otolaryngology

Oscar B. Hunter, Sr., M.D.
Washington, D. C.
Pathology

Margaret M. Nicholson, M.D.
Washington, D. C.
Pediatrics

Paul C. Swenson, M.D., Philadelphia, Pa.
Radiology

Richard B. Cattell, M.D., Boston, Mass.
Surgery

Claude F. Dixon, M.D.. Rochester, Minn.
Surgery

Frank C. Hamm, M.D.. Brooklyn, N. Y.
Urology

Lectures, symposia, clinicopathologic conferences, round-table luncheons, surgical and medical procedures in color television, technical exhibits and medical motion pictures. (All-inclusive registration fee—$20.00)

The Postclinical Tour By Air to Merida, Mexico City, Cuernavaca, Taxco, and Acapulco — March 15-29

For information concerning the Assembly meeting and the tour write Secretary, Room 103, 1430 Tulane Avenue, New Orleans 12, La.

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Dr. Albert Heyman, assistant professor of medicine, Emory University School of Medicine, Atlanta, was awarded a fellowship by the World Health Organization to visit England and Sweden. He spent two months visiting medical schools in London, Oxford, Edinburgh, Wales and Stockholm to study the methods employed in European medical schools in teaching environmental factors in medicine.

Dr. and Mrs. J. F. Mixson, Sr., Valdosta, recently celebrated their golden wedding anniversary.

Dr. Newdigate M. Owensby, Atlanta, has been appointed by the Board of Trustees of the American Academy of Neurology to membership on the newly formed Committee on Public Legislation of the Academy.

Dr. Jack Norris, Atlanta, has become an admiral in the Navy and will presumably defend the coast with noxious products from the pathology laboratory.

American Academy of Forensic Sciences will hold its fourth annual meeting in Atlanta, March 6-8.

Dr. L. P. Holmes, Augusta, was appointed a councilor of the American College of Radiology by the Board of Chancellors which met in Washington, D. C. recently, Dr. Holmes having been nominated by his local radiologic society.

Dr. A. M. Phillips, Macon, succeeds Dr. A. W. Bramblett, Jr., Forsyth, who has resigned as a member of the State Board of Health.

Dr. Hal Davison, Atlanta, has returned from Zurich, Switzerland, where he appeared on the program of the International Association of Allergists.

Dr. Robert H. Gillespie, Atlanta, has been made a diplomate of the American Board of Obstetrics and Gynecology.

Dr. George D. Meador is associated with Dr. A. W. DeLoach, Cairo, who recently located there for the practice of general medicine and surgery.

A new office building is being constructed at Tifton by Drs. C. S. Pittman and Carl Pittman, Jr.

Dr. John W. Daniel, Jr., and Mrs. Elizabeth Lynah Rumsey, both of Savannah, were married recently.

Dr. George R. Mayfield and Miss Janie Elizabeth Hillman, both of Augusta, were married recently.

KENTUCKY

Kentucky State Medical Association at its recent Centennial Meeting held in Louisville installed Dr. Clark Bailey, Harlan, president; and elected Dr. R. Haynes Barr, Owensboro, president-elect; Dr. Thomas V. Gudex, Louisville, Dr. Keith Smith, Corbin and Dr. R. Ward Bushart, Fulton, vice-presidents; Dr. Bruce Underwood, Louisville, secretary-editor; and Dr. Woodford B. Troutman, treasurer.

Kentucky State Medical Association in cooperation with the University of Louisville School of Medicine will broadcast by telephone scientific programs for one hour each month during February, March and April. Programs will eminate from the Medical School and will be under the direction of Dr. Herbert L. Clay, Louisville, who is Director of Postgraduate Refresher Training at the University.

Kentucky Chapter of the Academy of General Practice has elected Dr. Richard R. Slucher, Buechel, president: Dr. Keith P. Smith, Corbin, vice-president; and Dr. David G. Miller, Jr., Morgantown, secretary.

The recipients of the Kentucky State Medical Association's three annual awards as chosen by the House of Delegates at the annual meeting are: Dr. J. B. Lukins, Louisville, the E. M. Howard Award for outstanding service in behalf of organized medicine; Dr. John E. Kinchloe, Hardinsburg, the J. Watts Stovall Award as the outstanding general practitioner of the year; and Dr. Carl Norfleet, Somerset, the Distinguished Service Award.

Dr. E. L. Henderson, Louisville, immediate past President of the World Medical Association, was chosen one of the three members of its council at the annual meeting held in Stockholm, Sweden, in October. The Sixth Annual Assembly of this Association will be held at Athens, Greece (1952); the Seventh in Amsterdam, Holland (1953) and the Eighth in Rome, Italy (1954).

Dr. Samuel C. Smith, Ashland, is the new director of the Ashland-Boyd County Health Department. The former director, Dr. John Wilson, resigned to enter general practice in Ashland.

Dr. Thomas Stigall, formerly at Nichols Veterans Administration Hospital, Louisville, has opened an office in Louisville.

University of Louisville School of Medicine, Louisville, announces the appointment of Dr. U. Pentti Kokko as associate

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CLINICAL ALLERGY

A Different Approach

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Fellow American College of Physicians
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Fellow American College of Allergists
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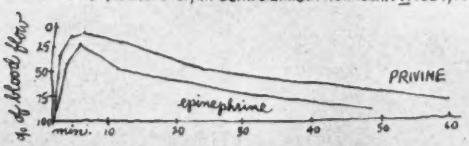
1. Meier, R., and Mueller, R.: Schweiz. med. Wchnschr. 71:554, 1941



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. the vessels are ⅓ further constricted by Privine than by epinephrine

CLINICAL FACT

Privine is a "potent vasoconstrictor"[2] one that is unsurpassed in providing marked relief from nasal congestion.

2. Jenkins, G. L., and Hartung, W. H. The Chemistry of Organic Medicinal Products. ed. 3, 1949. New York, John Wiley & Sons, Inc.

Practical Conclusion

just 2 drops of Privine® 0.05%

for effective nasal decongestion

Ciba Summit, N. J.

Continued from page 48

professor in Child Health Research. He will continue studies in poliomyelitis in the School's Kentucky Child Health Foundation Laboratory which is under the direction of Dr. Alex J. Steigman, professor of Child Health.

Dr. Fred E. Rankin, Lexington, was reelected regent for a three-year term of the American College of Surgeons at its annual meeting held in San Francisco, November 8.

LOUISIANA

Dr. Woodard D. Beacham, New Orleans, has been elected first president of the American Academy of Obstetrics and Gynecology. The National Federation of Obstetric-Gynecologic Societies has reconstituted itself as The American Academy of Obstetrics and Gynecology, the action being taken at the Federation meeting held in Atlantic City in June.

Dr. William A. Sodeman, New Orleans, was elected president-elect of the organization of a new scientific body, the American Society of Tropical Medicine and Hygiene, formed at a recent meeting in Chicago by the amalgamation of the 47-year-old American Society of Tropical Medicine and the 34-year-old National Malaria Society. Dr. Martin D. Young, Columbia, South Carolina, is the first president, and Dr. H. W. Van Hovenberg, Mt. Pleasant, Texas, vice-president.

New Orleans Surgical Society was organized in October by surgeons of the two medical schools and the following officers elected: Dr. Alton Ochsner, president; Dr. J. D. Rives, vice-president; Dr. Samuel Romano, treasurer; and Dr. Marshall L. Michel, secretary.

Tulane University School of Medicine has been awarded grants totaling $75,000 by the American Cancer Society for continued cancer research now being conducted at the School.

Dr. Roscoe Pullen, New Orleans, has been elected president of the attending staff of Charity Hospital. Other officers are Dr. Ambrose Storck, vice-president, and Malter Salatich of the Louisiana State University Medical School faculty, secretary-treasurer; Dr. Conrad G Collins, Dr. M. T. Van Studdiford, Dr. James Rives and Dr. E. J. Richard, members of the staff advisory committee.

Dr. Jack Weatherly has been appointed instructor in neuropsychiatry, Louisiana State University School of Medicine, and will serve as psychiatrist to the Mental Hygiene Clinic. He is a graduate of the University of Arkansas School of Medicine.

Dr. Elizabeth Bass and Dr. Clothilde Jacquet, New Orleans, were recently honored by the Orleans Altrusa Club for outstanding service to the community, and made honorary members of the organization.

Dr. Emma Moss was elected vice-president of the American Society of Clinical Pathologists at the Chicago meeting in October.

MARYLAND

Dr. Edwin L. Crosby, administrator of the Johns Hopkins Hospital, Baltimore, was named president-elect of the American Hospital Association at the 53rd annual meeting held in St. Louis, Missouri, in September.

Dr. E. Cowles Andrus, Baltimore, presided as president at the annual meeting of the American Society for the Study of Arteriosclerosis held in Chicago in November.

Dr. David Ross, formerly head of the Seton Institute of Baltimore, has been named medical director of the National Hospital for Speech Disorders, succeeding the late Dr. James S. Greene. Dr. Greene founded the hospital in 1916 and served as its head until his death in 1950.

MISSISSIPPI

Dr. T. E. Dye, Clarksdale, resigned effective December 1 as secretary of the Mississippi State Medical Association, having served continuously since 1918. Dr. George E. Twente, Jackson, has been appointed to fill the unexpired term. Mr. Rowland B. Kennedy was employed as executive secretary for the Association at a called meeting on September 19. Offices have been established in Room 508, First Federal Building, Jackson.

Mississippi Chapter of the American Heart Association has named Dr. T. E. Wilson, Jackson, president; Dr. Joe Melvin, Jackson, president-elect; Dr. Arthur Guyton, University, vice-president; Dr. John Archer, Greenville, secretary and Orrin Swayze, Jackson, treasurer.

Dr. William H. Parsons, Vicksburg, was elected a member of the executive committee of the Board of Governors of the American College of Surgeons at its annual meeting held in San Francisco, November 8. He was previously vice-chairman.

Continued on page 56

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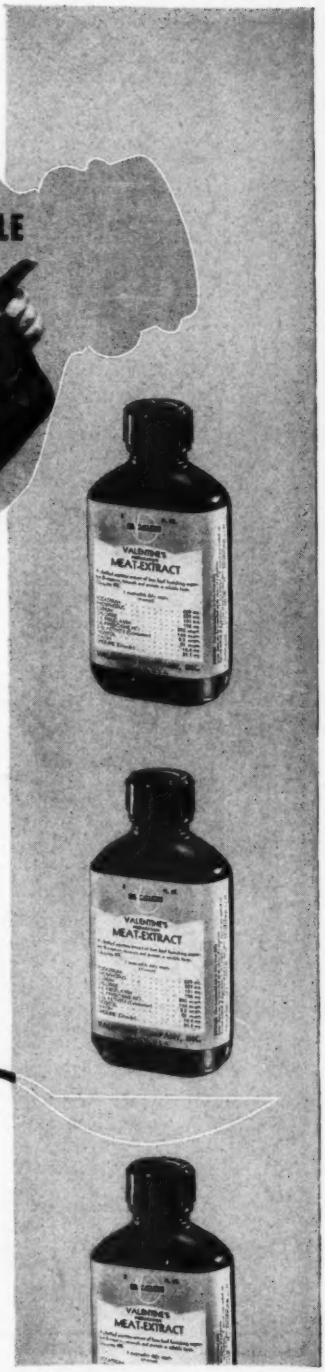

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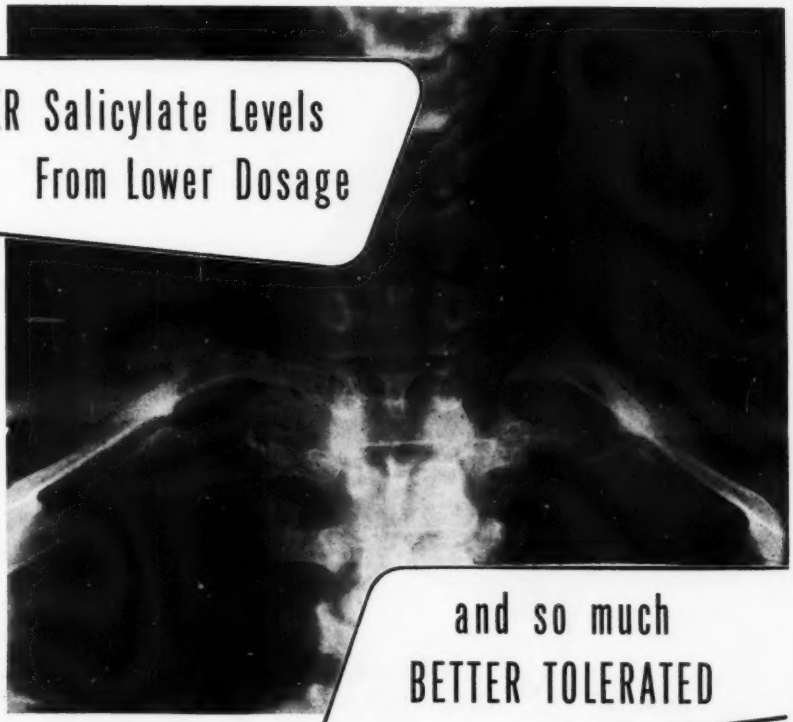

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Some of your most intelligent patients may fail to ask your advice regarding a proper douche. But when they ask, "What about douching, Doctor?" remember the therapeutic soundness and safety of Meta Cine.

Continued from page 50

MISSOURI

Dr. Daniel L. Sexton, St. Louis, was installed president of the Mississippi Valley Medical Society at the recent annual meeting held in St. Louis.

Dr. Alphonse McMahon, St. Louis, was elected Chairman of the Board of Trustees at the Mississippi Valley Medical Society meeting held in St. Louis.

Dr. Wendell G. Scott, St. Louis, was reelected treasurer of the American Roentgen Ray Society at its 52nd annual meeting held in Washington, D. C., recently.

Dr. Melvin A. Casberg, St. Louis, has resigned as dean of St. Louis University School of Medicine, effective July 1, 1952, because of an acute sensitivity to giant ragweed pollen found in the St. Louis area which necessitates a change of residence.

The contribution of more than half a million dollars given to the St. Louis University School of Medicine by James B. Miller, former president of Mines Equipment Company, at the time of his retirement, has been increased to approximately $700,000. The gift, an endowment to the Department of Internal Medicine, emphasizes research in emphysema, a disease which results from long-term asthmatic conditions and lung and bronchial infections. The research projects are being forwarded by Dr. G. O. Broun, professor of medicine, Dr. Herbert Sweet, Dr. Clement Sullivan, Dr. Burnett Peden and Dr. Gerard Mudd, all of St. Louis.

An oil painting of Dr. Dudley S. Conley, Columbia, Dean Emeritus of the University of Missouri School of Medicine, was presented to the University by the alumni of the Medical School on November 9. Dr. Conley was dean of the Medical School from August 1933 to August 1948, the date of his retirement.

Dr. Leroy A. Calkins, Kansas City, was installed president of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons at the recent meeting held in Hot Springs, Virginia.

NORTH CAROLINA

Dr. Clarence E. Gardner, Jr., professor of surgery, Duke University School of Medicine, Durham, has been elected to the examining board of the American Board of Surgery for a six-year term. Membership on the board is limited to thirteen surgeons in the United States.

Dr. Leslie B. Hohman, professor of neuropsychiatry, Dr. Kenneth L. Pickrell, professor of plastic surgery, and Murray Halfond, speech pathology clinician at the Duke University Medical School, Durham, are working on a new program aimed at creating a diagnostic and treatment center for speech and hearing problems in North Carolina in an attempt to educate parents to help their children by explaining the treatment to the parents.

Dr. Paul M. Gross, vice-president, Duke University, Durham, and president of the Oak Ridge Institute of Nuclear Studies, Oak Ridge, Tennessee, is the 1951 winner of the Distinguished Service Award for scientific achievement, an award given annually by the Southern Association of Science and Industry.

Dr. William L. Fleming, professor of preventive medicine, Boston University School of Medicine, Boston, has accepted the position as professor of preventive medicine and director of the Medical Outpatient Clinic of the University of North Carolina School of Medicine, Chapel Hill.

Dr. George C. Ham, who since 1946 has been at the Institute of Psychoanalysis in Chicago, has been appointed professor of psychiatry, University of North Carolina School of Medicine, Chapel Hill.

Dr. William James Cromartie, associate professor of bacteriology and medicine, University of Minnesota School of Medicine, Rochester, has been appointed associate professor in bacteriology and director of the Bacteriological Laboratory in the University of North Carolina Hospital, Chapel Hill.

Dr. B. Bruce Langdon has opened an office at Fayetteville for the practice of urology and urological surgery.

Dr. S. Clay Williams, Winston-Salem, has opened offices in the Reynolds Building for the practice of internal medicine.

Dr. Paul G. Fillmore, now under an Atomic Energy Commission fellowship at Duke University School of Medicine, Durham, and Dr. Robert F. Poole, Jr., Durham, both members of the Atomic Bomb Casualty Commission in Japan, together with Dr. Grant Taylor, assistant dean of Duke Medical School who is now directing the atom project, went to Japan in 1949. Dr. Fillmore, who recently returned from the two years' work, said that most of the Japanese who were A-bombed in 1945 are "perfectly normal except for a few scars;" that the people recovered from the immediate, acute effects in a period of weeks or

Continued on page 60

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intravenously, intramuscularly, subcutaneously

In respiratory and other emergencies resulting from medullary depression during anesthesia. Ampules 1 and 3 cc., tablets, solution, powder.

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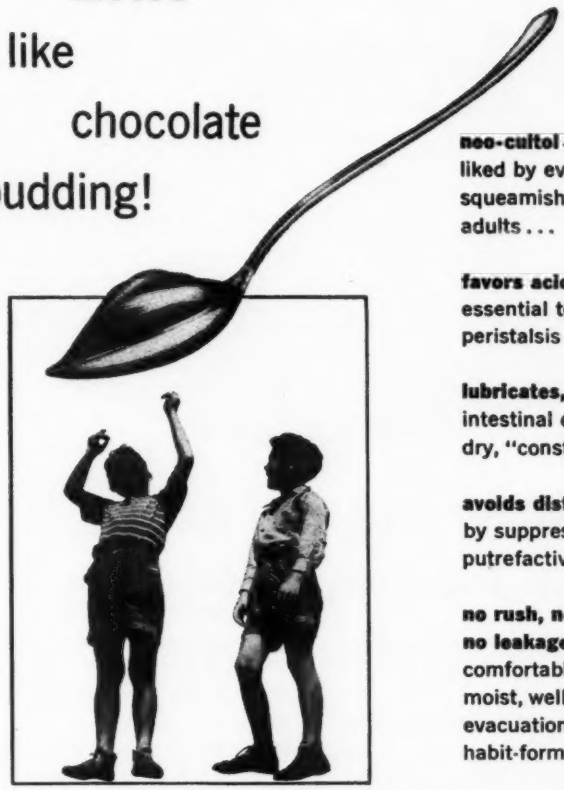
provides viable L. acidophilus which multiply rapidly in the colon, in a chocolate-palatable mineral oil jelly.

tastes like chocolate pudding!



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avoids distressing flatulence by suppressing putrefactive bacteria.

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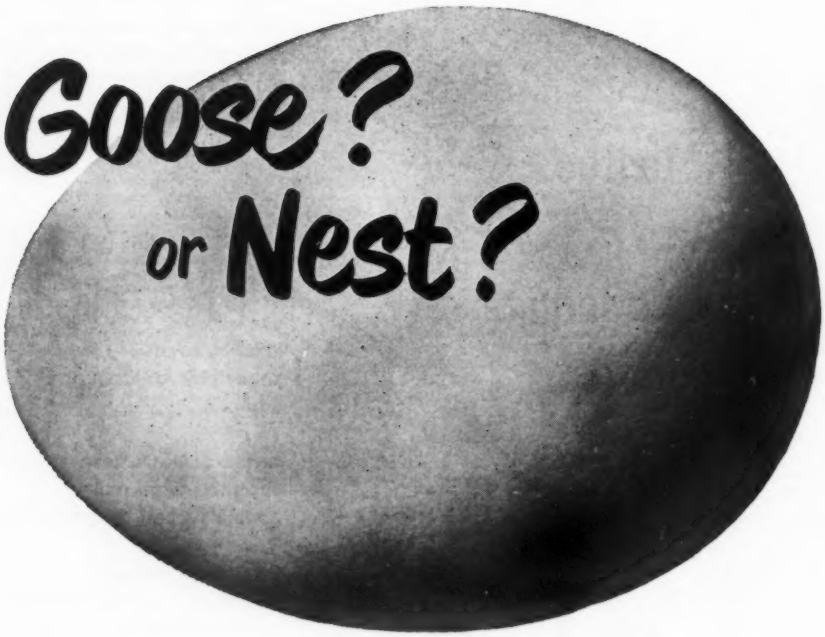

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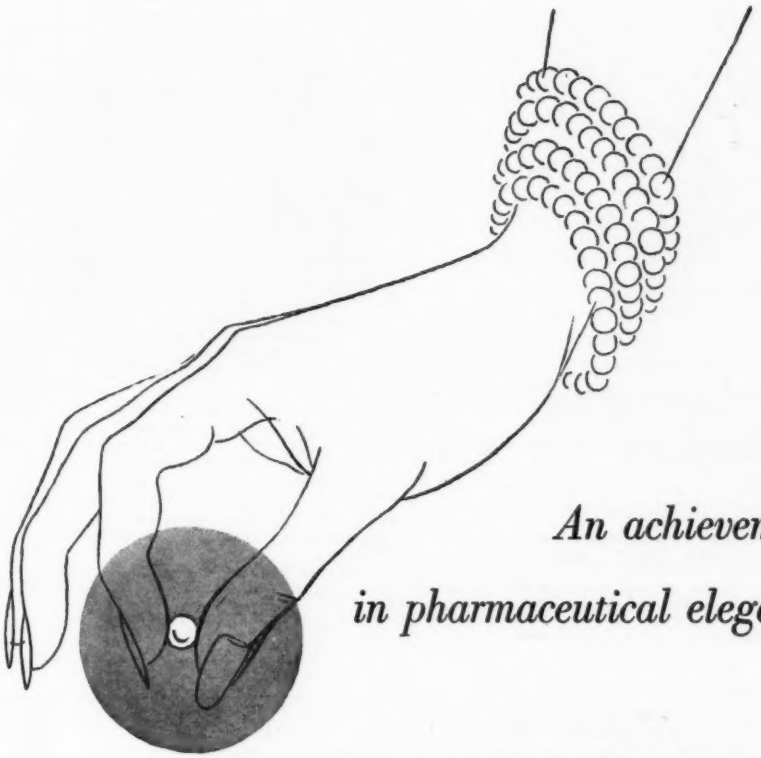

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OMNI-VITA* Spherettes

"The preferable way to prescribe vitamins"

WILLIAM R. WARNER
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Continued from page 56

months; that most Japanese people who have developed cataracts are not hindered in keeping their jobs as radiation cataracts of the eye can be removed by a comparatively simple operation; that tuberculosis exists due to crowded living conditions, the hospital facilities being limited; and that ABCC is a long-term project that is continuing to look for other differences in exposed and nonexposed persons, the major divisions of the project being genetics, pediatrics and medicine.

OKLAHOMA

Dr. Otis E. Snow, Yukon, is the new medical director and assistant superintendent of the Oklahoma State School, Enid.

Dr. Forest R. Brown succeeds Dr. Mack I. Shanholtz as director of the Seminole County Health Department.

Dr. Fred D. Switzer, formerly of Hugo, is practicing in DeQueen, Arkansas.

Dr. Thomas J. Huff, Jr., has opened offices in Oklahoma City.

Dr. Charles Roberts has moved from Taloga to Lake Preston, South Dakota.

SOUTH CAROLINA

Dr. William Weston, Sr., Columbia, has submitted his resignation as delegate to the American Medical Association House of Delegates, after filling this office for over fifteen years.

Dr. J. I. Waring, Charleston, has been elected state chairman for the American Academy of Pediatrics.

South Carolina Chapter of the American College of Surgeons has elected Dr. Leland J. Brannon, Columbia, president; Dr. C. R. F. Baker, Sumter, vice-president; and Dr. Weston Cook, Columbia, secretary, reelected.

The unveiling of a portrait of the late Dr. W. J. Young took place recently at the Allendale Hospital, Columbia. Dr. Young was one of the benefactors of the institution.

Dr. George R. Dawson, Jr., Florence, has announced the association of Dr. Howard W. Mahaffey in the practice of orthopedic surgery.

Dr. and Mrs. R. M. Pollitzer, Greenville, recently went to Uruguay to attend an International Pediatric medical meeting.

Dr. Pearce Bailey, formerly chief of the Veterans Administration's Section of Neurology, Charleston, is the first director of the National Institute of Neurological Diseases and Blindness, an institute established by act of Congress last summer.

Dr. Mills Goodlett has moved from Pelzer to Williamston where he will be associated with Dr. Dwight Smith in practice.

TENNESSEE

Dr. Nat Copenhaver, Bristol, has been named president-elect of the Mayo Foundation for Medical Education and Research, this being the fourth time in 34 years that a Southerner has been named president of this association. Dr. R. L. Sanders, Memphis, was president of the Foundation in 1929.

Dr. Frank H. Luton, Nashville, was elected a counselor of the Central Neuropsychiatric Association at a meeting held in St. Paul and Minneapolis in October. The next meeting will be held in Nashville in October 1952.

Dr. Ralph M. Kniseley, formerly of Albuquerque, New Mexico, is the new pathologist with the Oak Ridge Hospital and the Medical Division of the Oak Ridge Institute of Nuclear Studies.

Dr. R. P. Beasley, Dickson, was elected mayor of that town recently.

Dr. Joel J. White, retired Navy rear admiral, is Medical Director, St. Mary's Hospital, Knoxville.

Dr. R. C. Cravens is associated with Dr. Denton Norris at the Cravens-Norris Clinic, Jamestown.

Dr. Murrel Froedge, formerly of Glasgow, Kentucky, is associated with Dr. Max Painter at the Painter Clinic, Lafayette.

Dr. Lawrence B. Molloy has opened offices at Lawrenceburg. He is a graduate of Vanderbilt University School of Medicine, Nashville.

University of Tennessee Medical Units, Memphis, has added to the staff of the Division of Anatomy: Dr. Robert Lewis Bacon,

Continued on page 66

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HYDROCHLORIDE
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(Brand of lidocaine hydrochloride*)
AN AQUEOUS SOLUTION

QUICK ACTING
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A potent, short-acting local anesthetic, producing on injection, a more prompt, intense and extensive anesthesia than equal concentrations of procaine hydrochloride. Useful and effective either with or without epinephrine, it has been described (1) as the most promising of the new local anesthetics, approaching in efficiency the nerve blocking properties of piperocaine, and in toxicity, the advantages of safety presented by procaine.

(1) Hanson, I. R. and Hingson, R. A., *Current Researches in Anesthesia and Analgesia*, 29:136 (May-June) 1950

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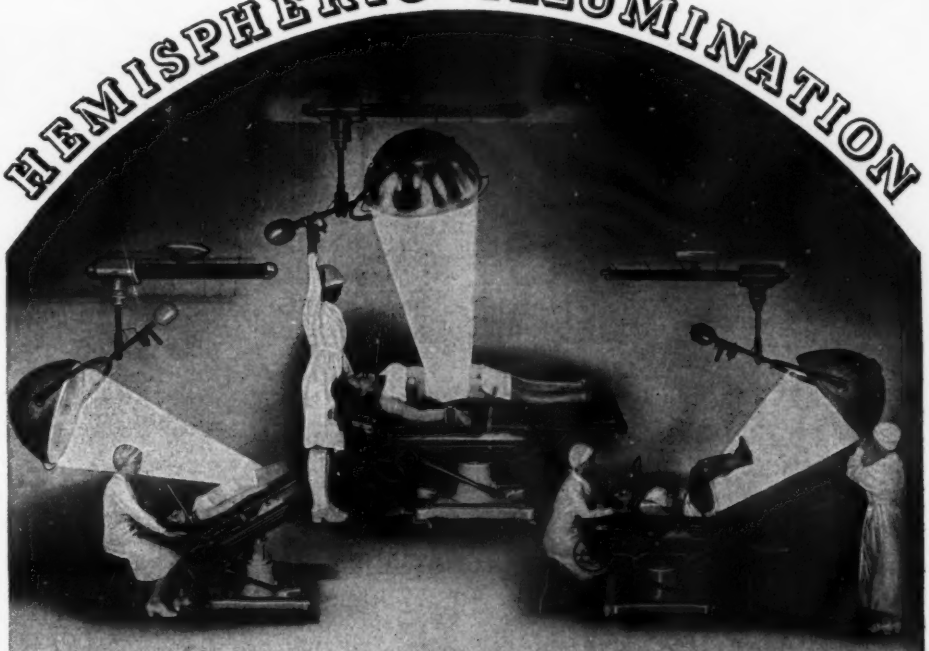

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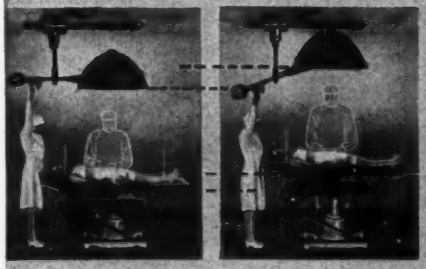

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of cool illumination with equal shadow reduction to compensate for varying incision characteristics.

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A new case history with pictures

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Patient: S.M. (shown in photos on opposite page), "a lovely old lady", age 80, afflicted with arteriosclerosis, cardio-renal insufficiency, degenerative osteoarthritis and diabetes mellitus. She is "plagued with nervousness, profound weakness, vertigo, and pain."

"The only thing she asked of life was that she die before her children. Life did not grant her this balm. The untimely death of a daughter through suicide wrapped every one of her reflections in a package of misery."

Medical treatment: "Despite ... her cardiovascular pathology, I resorted to Dexamyl as the best of the geriatric armamentarium. At first she received two tablets on arising; one at noon; and one at 5 P.M. After two months I was able to reduce the dosage."

Results: "Dexamyl did not fail. It relieved her nervous uncertainty, her depressive weariness, her melancholia and her tearfulness. Dexamyl helped her to smile again."

Dexamyl its "normalizing" effect

ameliorates mood . . . relieves inner tension

Each tablet contains Dexedrine* Sulfate (dextro-amphetamine sulfate, S.K.F.), 5 mg.; Amoborbital, Lilly, ½ gr. (32 mg.) *T.M. Reg. U.S. Pat. Off.

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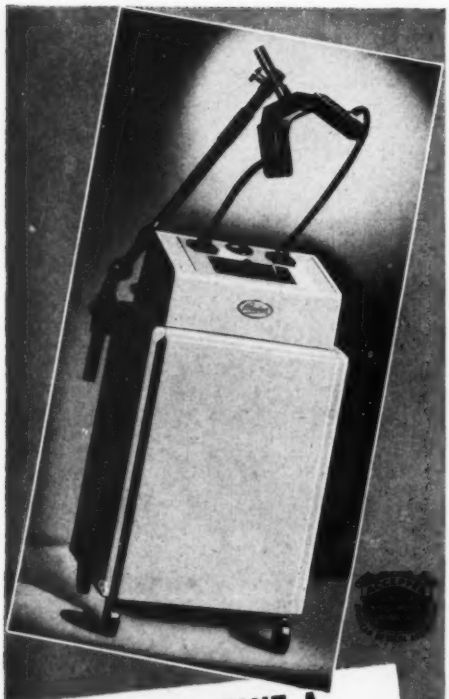
These unposed photographs of patient S.M. were snapped during an actual interview with her physician. She is describing her symptoms of mental and emotional distress. See the opposite page for the case history of this patient.



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THE BURDICK CORPORATION
MILTON, WISCONSIN

Continued from page 60

formerly on the staff of Stanford University School of Medicine, Stanford, California, as associate professor; Dr. Sidney Arthur Cohn; and Dr. Lew S. Cunningham, formerly a research fellow of the American Cancer Society at Stanford University.

Mr. Joseph Augustin LePrince, Memphis, eminent sanitary engineer, was recently honored by the National Malaria Society, which presented to him its first Joseph Augustin LePrince Award, establishd in his honor to recognize "outstanding accomplishment in malaria control."

Dr. Franklin B. Bogart, Chattanooga, was appointed a councilor of the American College of Radiology by the Board of Chancellors which met in Washington, D. C., recently. Dr. Bogart was nominated by his local radiologic society.

Dr. William Hamilton Walker has opened offices in the Medical Arts Building, Memphis, for the practice of urology and urological surgery.

Dr. Edwin J. Lipscomb and Dr. Moore Moore, Jr. have become associated with Dr. Wendell L. Whittemore in the practice or orthopedic surgery in the Methodist Hospital Doctors Building, Memphis.

TEXAS

The new Methodist Hospital, Houston, the newest member of the Texas Medical Center, was formally opened November 10. Major gifts to the building fund of this hospital included $1,000,000 from Mr. and Mrs. H. R. Cullen, $500,000 from the M. D. Anderson Foundation, and $100,000 from the Wiess family.

Dr. Jack R. Ewalt has resigned as dean of the University of Texas Postgraduate School of Medicine in the Texas Medical Center, Houston, to become Commissioner of Mental Health for the State of Massachusetts. In his new position he will have the responsibility for the operation of seventeen Massachusetts state hospitals having in excess of 30,000 patients. Dr. Ewalt will also have a teaching appointment in psychiatry at Harvard Medical School, Boston.

Texas Surgical Society at its recent meeting elected Dr. Robert M. Moore, Galveston, president; Dr. F. L. Snyder, Fort Worth, first vice-president; Dr. Andrew Small, Dallas, second vice-president; and Dr. Albert W. Hartman, San Antonio, secretary. The next meeting will be held in Houston, April 7-8.

Dr. Arild E. Hansen, professor of pediatrics, University of Texas Medical Branch, Galveston, was presented the outstanding achievement award of the University of Minnesota, an award reserved for former students who have attained high eminence and distinction.

University of Texas Medical Branch, Galveston, has added to its faculty: Dr. Victor C. Calma, assistant professor of physiology; Dr. Ed Rowe, instructor in surgery; Dr. J. F. Mullins, instructor in dermatology and syphilology; and Dr. Edward G. Rennels, Ph.D., assistant professor of anatomy.

Texas medical programs will be broadcast by telephone during January, February and March through the Texas Medical Association.

Plans are being made for a $4,000,000 hospital and medical center for crippled children at Fort Worth. The W. I. Cook Memorial Trust has been given about $1,250,000 under an agreement providing for conversion of W. I. Cook Memorial Hospital

Continued on page 68

Classified Advertisements

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RESIDENCIES IN PATHOLOGY AVAILABLE—The Veterans Administration Hospital, Coral Gables, Florida, announces the availability of appointments in an approved three year residency in Pathology. Address letters of inquiry to the Chairman, Deans Committee, L. G. Rowntree, M.D., duPont Building, Miami, Florida.

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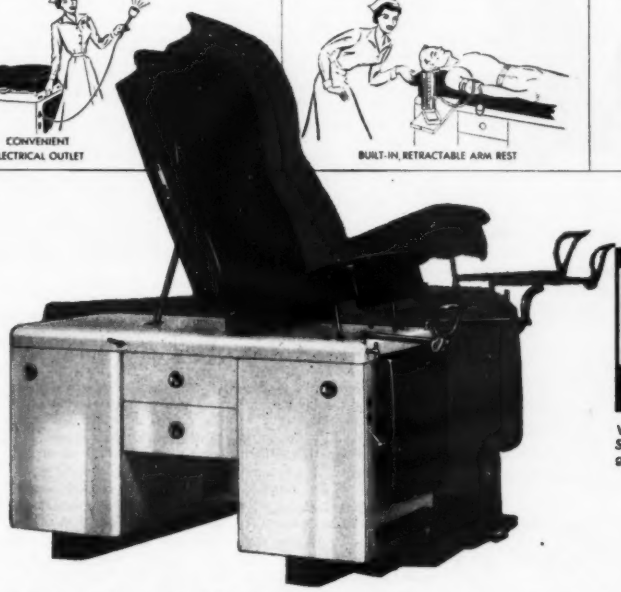

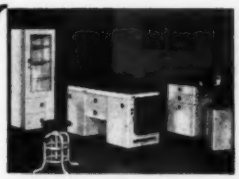

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Continued from page 66

and funds of the Fort Worth Children's Hospital into a new children's medical center; the center is to be known as the W. I. Cook Memorial Hospital for Children. The unit for treatment of crippled children will be designated the Tom B. Owens Institute for Crippled Children. The project is expected to be completed by December 1952.

Dr. Charles L. Martin, Dallas, was elected president-elect of the American Roentgen Ray Society at its 52nd annual meeting held recently in Washington, D. C.

University of Texas, Galveston, has received a $32,400 Atomic Energy Commission research contract for studies on radiation effects; and a $50,000 grant from the Rockefeller Foundation for research on fundamental genetics. Dr. Wilson S. Stone, professor of zoology and gene research director, will supervise both the radiation and gene projects. Assisting him in the investigations will be Drs. R. P. Wagner, A. R. Schrank and W. Frank Blair of the zoology department, and Dr. Orville Wyss, professor of bacteriology; Dr. J. T. Patterson, professor of zoology and director of zoology research at the University; and Drs. Michael J. D. White, C. P. Oliver and M. R. Wheeler of the zoology department.

Dr. E. E. Snell of the University of Texas will use the $6,000 grant awarded by Sharp & Dohme of Philadelphia for research on a problem of bacterial metabolism.

VIRGINIA

Medical Society of Virginia at its 104th annual meeting held at Virginia Beach in October installed Dr. John T. Hundley, Lynchburg, president; and elected Dr. James L. Hamner, Mannboro, president-elect; Dr. Ira L. Hancock, Creeds; Dr. Walter P. Adams, Norfolk, and Dr. Mary Elizabeth Johnston, Tazewell, vice-presidents; and Robert I. Howard, Richmond, executive secretary-treasurer.

Dr. W. A. Werner is health officer of the Lee-Scott Health District recently organized, with headquarters at Gate City and a branch office in Jonesville.

Dr. A. R. Wilson Climie has been appointed health officer of the Alleghany-Botetourt Health District with headquarters in Covington.

Dr. William V. Harrison is the new health officer of Carroll-Grayson Health District with headquarters at Galax.

Dr. Joseph M. Rose is the new health officer of Pittsylvania Health District with headquarters in Chatham.

Dr. R. B. Blackwell has resigned as health officer of Buena Vista-Lexington-Rockbridge Health District to accept the position as health officer of Newport News.

Dr. Charles Roger Lyons, formerly of Montana, replaces Dr. Charles R. Woolwine as health officer at Virginia Polytechnic Institute.

Dr. Richard Fowlkes, Richmond, was elected president of the Southeastern Dermatological Association at its meeting held in Birmingham, Alabama, recently. The next meeting of the organization will be held in Nashville, Tennessee.

Two hospitals recently dedicated are the Louise Obici Hospital, Suffolk, and the Shenandoah County Memorial Hospital, Woodstock.

Dr. Wm. T. Sanger, president of the Medical College of Virginia, Richmond, has been chosen president-elect of the National Society for Crippled Children and Adults.

WEST VIRGINIA

Dr. J. A. Haney succeeds Dr. Edwin J. Kroeker, resigned, as assistant superintendent, Hopemont Sanitorium, effective December 1.

Dr. Max Koenigsberg, Charleston, has been elected an associate fellow of the American College of Allergists.

Dr. Eugene S. Carter, Jr., Montgomery, has accepted a fellowship in internal medicine at the Lahey Clinic, Boston.

Dr. J. B. Baber, Huntington, has retired from active practice on account of ill health.

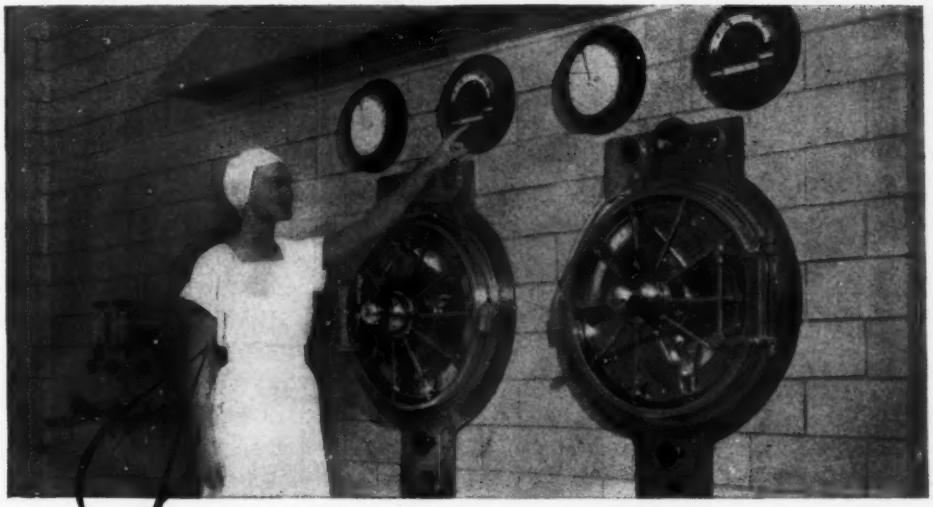
Dr. Robert Stenberg, Richmond, Indiana, succeeds Dr. Thomas S. Knapp as superintendent, Spencer State Hospital.

Dr. Don V. Hatton, Oak Hill, has moved to Williamson.

Dr. Wilson Brown, Narrows, Virginia, has accepted a three-year residency in radiology at a hospital in Shreveport, Louisiana.

Dr. William V. Crabtree, Wellsburg, has located at Cass for the practice of medicine.

Dr. Thomas S. Knapp, formerly superintendent at Spencer State Hospital, is engaged in the practice of his specialty of psychiatry, being associated with Dr. William B. Rossman, Charleston.



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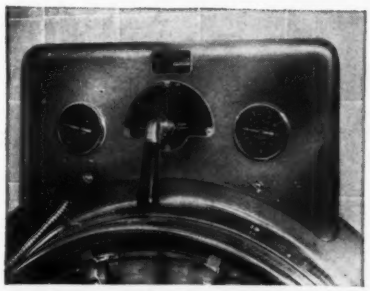

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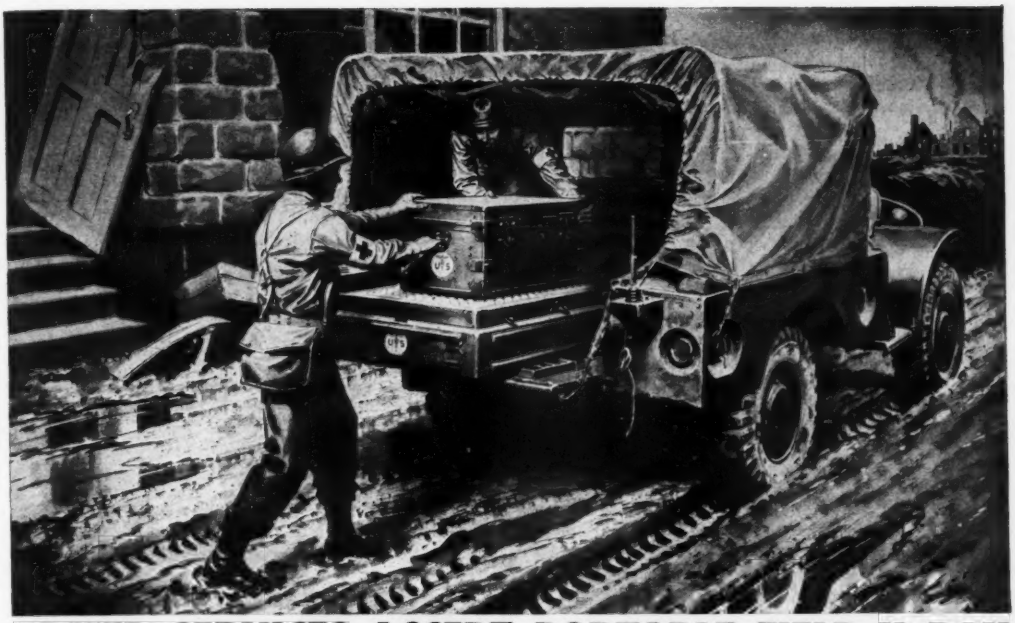

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Like its forerunner, the U. S. Army Field X-Ray Unit of World War II, the new machine was designed and developed by the Picker X-Ray Corporation on its own initiative and at its own expense, with no development cost to the government. Quantity production is already well under way.

The unit is so portable and so self-sufficient that it can be used anywhere, even in forward areas. For transport it knocks down into two chests which are light enough to be moved by a medical team, compact enough to be carried in a jeep, or light truck, and rugged enough to be safely parachute-dropped. On arrival, the machine takes only five minutes to assemble for use in Mobile Field and Evacuation Hospitals. It will operate anywhere: on community power lines if available, or using a companion portable gasoline motor-generator. Picker X-Ray Corporation, 25 South Broadway, White Plains, New York.

FIVE MINUTES is all it takes to assemble the new Picker machine; no tools are needed. The lid of the long chest becomes the table front: other parts unfold into position or are attached in sequence. Packing members become operating parts.

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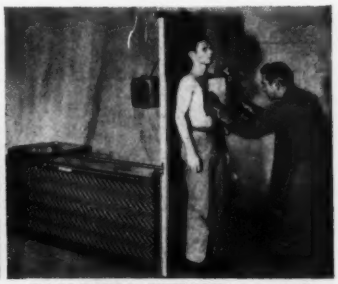

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THE LONG AUGUST NIGHT WAS HOT—but not as hot as the bitter fighting that raged about Agok, Korea, in the Naktong River area. Sergeant Kouma, serving as tank commander, was covering the withdrawal of infantry units from the front. Discovering that his tank was the only obstacle in the path of an enemy breakthrough, Sergeant Kouma waged a furious nine-hour battle, running an eight-mile gantlet through enemy lines. He finally withdrew to friendly lines, but not until after his ammunition was exhausted and he had left 250 enemy dead behind him. Even then, although wounded twice, he attempted to resupply his tank and return to the fighting.

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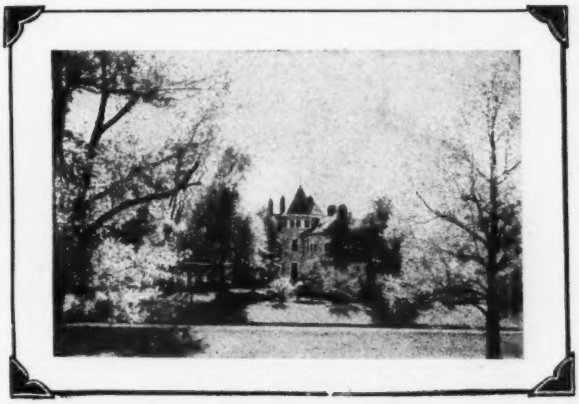

This view of the Administration Building is typical of the restful beauty of the Westbrook 125-acre estate.

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To meet your requirements for different vitamin combinations for drop dosage, Doctor, Mead's has 3 palatable liquid vitamin preparations—POLY-VI-SOL, TRI-VI-SOL and CE-VI-SOL.

All three of Mead's "Vi-Sols" are formulated and manufactured with the meticulous care and scientific control that have always characterized Mead's vitamin products.

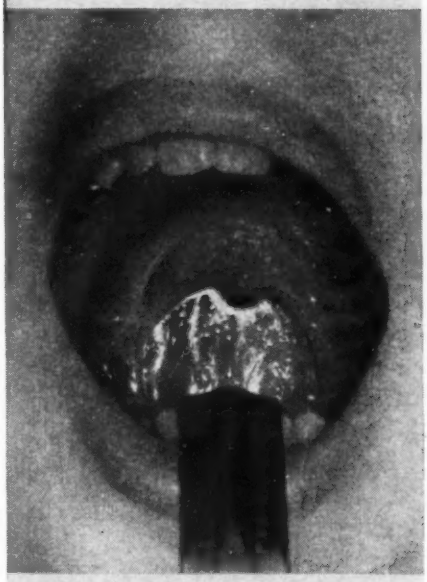
	Vitamin A	Vitamin D	Ascorbic Acid	Thiamine	Riboflavin	Niacinamide
POLY-VI-SOL each 0.6 cc. supplies	5000 units	1000 units	50 mg.	1 mg.	0.8 mg.	5 mg.
TRI-VI-SOL each 0.6 cc. supplies	5000 units	1000 units	50 mg.			
CE-VI-SOL each 0.5 cc. supplies			50 mg.			

AVAILABLE IN 15 AND 50 cc. BOTTLES WITH CALIBRATED DROPPER

MEAD'S

MEAD JOHNSON & CO.
EVANSVILLE 21, IND., U.S.A.

Pharynx before administration of Paredrine-Sulfathiazole Suspension



After the intranasal instillation of Paredrine-Sulfathiazole Suspension

these photographs show a most effective way to treat

sore throat

Instilled intranasally, Paredrine-Sulfathiazole Suspension drifts down over the nasopharynx and pharynx; coats infected areas with a soothing, bacteriostatic frosting. It is not quickly washed away, but clings to the throat for hours—assuring prolonged bacteriostasis. The Suspension is particularly effective in sore throat when instilled on retiring. Frequently, it produces bacteriostasis (and analgesia) all night long.

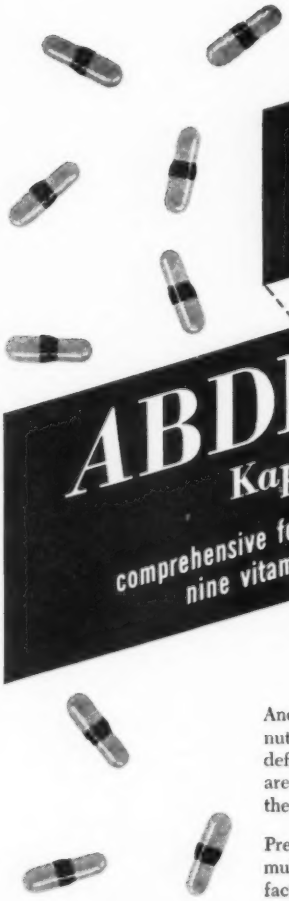
Smith, Kline & French Laboratories, Philadelphia

Paredrine-Sulfathiazole Suspension

Vasoconstriction in minutes... Bacteriostasis for hours

A *suspension* of 'Micraform' sulfathiazole, 5%, in an isotonic aqueous medium with 'Paredrine' Hydrobromide (hydroxyamphetamine hydrobromide, S.K.F.), 1%; preserved with ortho-hydroxyphenylmercuric chloride, 1:20,000.

'Paredrine' and 'Micraform' T.M. Reg. U.S. Pat. Off.



in chronic illness...

ABDEC® Kapseals®

comprehensive formula of nine vitamins

for prophylaxis and therapy of deficiency disease

"The possibility that deficiency diseases may develop in chronically ill patients must be anticipated by the physician, so that effective prophylaxis or therapy may be instituted."*

Anorexia, restricted diets, impaired absorption and utilization of nutrients, fever, and infection predispose to the development of deficiency diseases in long-term illness. Since "... deficiency diseases are seldom due to the inadequate ingestion of only one vitamin ... the necessity for balanced multiple vitamin therapy is accepted ...."*

Prescribed in chronic illness, **ABDEC** Kapseals provide the balanced multiple vitamin combination of water-soluble and fat-soluble factors required for prevention and correction of deficiency diseases.

dosage:

For the average patient, one ABDEC Kapseal daily; during pregnancy and lactation, two Kapseals daily. Three Kapseals daily are suggested in febrile illnesses, for preoperative and postoperative patients, and in other conditions in which vitamin deficiencies are likely to occur.

each ABDEC Kapseal contains

Vitamin A	10,000 U.S.P. units
Vitamin D	1,000 U.S.P. units
Mixed Tocopherols (Vitamin E factors)	5 mg.
Vitamin B_1 (Thiamine Hydrochloride)	5 mg.
Vitamin B_2 (Riboflavin)	3 mg.
Vitamin B_6 (Pyridoxine Hydrochloride)	1.5 mg.
Pantothenic Acid (as the Sodium Salt)	5 mg.
Nicotinamide	25 mg.
Vitamin C (Ascorbic Acid)	75 mg.

Supplied in bottles of 50, 100, 250 and 1000.

*Cayer, D., in Kyser, F. A.: Therapeutics in Internal Medicine, New York, Thomas Nelson & Sons, 1950, p. 280.

PARKE, DAVIS & COMPANY

MEDICAMENTA VERA